

# amateur radio



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**1967**

**25c**

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TR1001, English (inter. version of SCR222), 15 watts, 21 valves. Freq. coverage: 115 to 140 Mc. Crystal locked receiver. Transmitter uses T115 output valves. Three stage exciter uses 4.8 Mc. crystal osc. 6AM5, double 6AM5 driver amp. Q100, 7.5 Mc. 6AM5. Integral modulator, complete with 20 volt generator. Condition as new. To class A15 (\$30). Circuit for above unit, 10/- each.

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## FEDERAL COMMENT



### COMMUNICATION BREAKDOWN?

Without really thinking, most Amateurs probably agree with the proposition that communications is their hobby. In a sense the proposition is, of course, completely accurate.

Yet a failure of communications is probably a fundamental cause of many of the things that worry Amateurs and cause concern within the Amateurs' organisation. The failure on the part of the organisation to communicate to its members what it has done, or has not done—and why; the failure of the members to communicate to their organisation what they wish to be done—and why; the failure of Amateurs to communicate to non-Amateurs what Amateurs are, what they do and what they can do; the failure of one Division to communicate to another Division sufficient information so that the one can at least appreciate the other's point of view—all these are failures in communication.

Failures in radio communication can occur not only because of transmission failure, but also as a result of a failure in reception. This is also true of the communication of facts and ideas between people. The repetition of incorrect information is also evidence of a communication failure.

On these failures are built misunderstandings, for we criticise and are criticised on the basis of wrong information or insufficient information. From this, resentment follows naturally and tolerance disappears. Misunderstandings, criticism, resentment and lack of tolerance are all factors that result in the weakening of any organisation.

Maybe we, as communicators, should be able to pride ourselves on our communications. Can we?

—JOHN BATTRICK, VK3JR, Federal Secretary Elect.

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# W.I.C.E.N. IN TASMANIA DURING THE BUSH FIRE DISASTER

GREG. JOHNSTON,\* B.Sc., VK7ZKJ

Date: February 7, 1967; Time: about 1215 E.A.S.T.

Location: Hobart area.

Situation: Temperature 160+°F, winds gale force from north. Commercial radio sources calling for volunteer firefighters for many areas all around southern Tasmania. Smoke haze thickening rapidly in city area.

HAVING thus set the scene, it is not remarkable that the 6 metre mobile net frequency was well occupied from about 1215 E.A.S.T. and about two hours later was being used in earnest by several mobiles. About that time the first attempts at organisation were made when, after consultation with Tom VK7AL and after ascertaining that phone exchanges were jammed, lines were down and power off in many suburbs, Dave VK7ZMD was sent into the Fire Brigade Hq. with 6 metre mobile gear to relay direct to them fire reports from mobiles moving around trouble spots lacking telephone communications through fire or exchange overload. When the Fire Brigade personnel realised that they could no longer use the information being relayed to them, due to complete occupation of all their personnel and resources, VK7ZMD was relieved of duty.

At about this time the official P.M.G. station, with the R.I. on the mike, came up on the 6 metre net frequency and informed all stations that they were officially urged to continue to handle distress traffic.

This gets us to the point where but one commercial radio source was still

\* 3 Argyle Street, New Town, Tasmania.

on the air broadcasting a continual stream of queries and requests for firefighters. Someone, I don't know who, suggested we put a base mobile outside the studio of this radio station (7HT) and use the mobiles to try and assist them in the job they were doing. One query satisfied after a short relay, due to power lines across the road, concerned the fate of the children from the Tarroona Primary School. They had been evacuated to the beach in a timely move by their teachers and were being looked after. No doubt the parents of these children were very relieved to hear this news come back over 7HT after a 6 metre VK7ZKJ to VK7ZB to 7HT relay. All commercial communications were out into Tarroona area.

At about 1700 hours the President of the W.I.A. (Tom VK7AL) approached the Police and offered our services as a going concern. About two hours after, Tom received a telephone call from the Police asking for help with communications into Huonville. At this stage we were able to inform them that the situation had been taken in hand by our organisation working in conjunction with Civil Defence and that communication should shortly be available.

## NETS ESTABLISHED

Also at 1700 hours Lee VK7KC contacted Jack VK7JB on 3590 Kc. with the upshot being that VK7JB went to Civil Defence Headquarters only to find Ted VK7EB in attendance with equipment half set up on 3590 Kc. Shortly after this, at about 1715 hours, VK7KC and VK7EB set up a 3590 Kc. link, with VK7KC also linking through on 6 metres to most of the mobiles from his own mobile. At approx. 1730 hrs. VK-

7ZKJ arrived at VK7KC's QTH with a.c. operated 6 metre rig and installed it as base station for the mobile net on 53.035 Mc. Thus by 1730 hrs. we had W.I.C.E.N. control station linked to Civil Defence Hq. on 80 metres. Civil Defence in turn had facilities for distributing the information W.I.C.E.N. obtained to the appropriate quarters.

Very soon after this, with situation reports coming in rapidly and finding coverage was not up to the mark on 6 metres because mobiles were getting too far out of the city area, a relay station was set up on Mt. Rumney by Barry VK7ZBJ and Ron VK7ZRO at about 1815 hrs. Mt. Rumney was burnt off prior to this, but was dangerous with trees coming down over the road—it is situated east of Hobart overlooking the airport and so situated as to be a highly favoured location for extended 6 metre ground wave communication.

Thus by 1815 hours W.I.C.E.N. had set up 6 metre facilities allowing communication over a radius of about 30 miles from Hobart, had several 6 metre mobiles in trouble spots sending in situation reports, several more mobiles standing by, and a 3.5 Mc. link from W.I.C.E.N. Control to Civil Defence Hq. relaying information coming in on 6 metres for routing to Police or other services.

By 2100 hrs. VK7ZZ, VK7MF and VK7DR were handling traffic on 40 metres in relation to P.M.G. communication replacement requirements.

As the roads were very dangerous in most areas outside the metropolitan area with bridges burnt out and power and phone poles coming down across the roads, all mobiles were recalled at approx. 0100 hrs. Feb. 8 after many



View of burnt out Springs Hotel. Cover photograph shows the remains of the hotel with Mt. Wellington and L.V. mast in background. Hotel was double story, unlicensed, tourist stopping place for morning and afternoon tea half way up Mt. Wellington.



Civil Defence Headquarters, Public Buildings, Hobart.  
Back: Jack Batchelor, VK7JB.  
Front left: Crosby Russell-Green, VK7CR.  
Front right: Ted Cruise, VK7EZ.

operators had sent in information indicating the situation in most of the disaster areas via W.I.C.E.N. control to the Civil Defence Hq. and thence the Police Commissioner as head of the emergency operations. Communications were not established with Huonville on Feb. 7 as all roads into the area were impassable when our assistance was requested. W.I.C.E.N. Control and Civil Defence link (C.D. link) closed at approx. 0215 hrs.

All links and relays were operational again by 0900 hrs. on the 8th. Several 6 metre mobiles were on standby and several others active, in some cases in areas which had been lacking any communication for 24 hours. Many hours were wasted by three mobiles who were despatched to pinpoint a fire reported in the Carlton area in three separate bogus reports to the authorities who requested us to confirm or otherwise.

in direct communication with W.I.C.E.N. Control at 2300 hrs. Up until this time additional traffic was coming through Mt. Rumney from Mike VK7ZMC who set up a base station with his 6 metre mobile at the Woodbridge relief centre—this was the sole communication service available in the area south of Staig.

Also on the 8th, from 1100 to 1415 hrs., VK7ZZ was handling traffic to mainland VK for the Departments of Social Services and Labour and National Services, broadly concerned with damage and staff requirements.

#### EXTRA RELAY STATION INSTALLED

The situation continued virtually unchanged on the 9th with the exception that to provide against overloading the 6 metre frequency at the Mt. Rumney relay site, at peak traffic periods an alternate 2 metre link from this site

motor driven generating plants. This h.f. link between Richmond and Colebrook was maintained until 1800 hrs. on 14th February.

By Saturday 1100 hrs. (i.e. 11th), this h.f. point to point link was integrated fully into the W.I.C.E.N. system with the installation of a complete station on Mt. Wellington by John VK7ZJG, assisted by VK7ZKJ, at the premises of TVT6 transmitter and we were fortunate to have been able to "borrow" quarters and 240v. a.c. from their emergency generating system. Our thanks are due to TVT6 for allowing us to use their facilities during this period.

Thus was set up a relay station capable of reception on any Amateur frequency up to 2 metres and capable of patching the received signal to W.I.C.E.N. Control and C.D. Hq. simultaneously on 6 and/or 2 metres merely at the flick of a switch.



W.I.C.E.N. Control at the residence of VK7KC.  
Lee Cordell, VK7KC, at the mike.



Traffic being handled at W.I.C.E.N. Control.  
Rear: Lee VK7KC; foreground: Ian (Associate).

As fire relief centres were set up in the country centres, mobiles endeavoured to contact their organisers and transmit back any urgent food and clothing requirements they had.

Two mobiles with 6 and 80 metre equipment were set up in Huonville during the late afternoon and while Winslow VK7WH was getting set up to relay on 6 after QRM from Amateurs outside VK7 had forced closure of the direct Huon-Hobart 3590 link, Terry VK7CT was passing distress traffic on 3590 per c.w. to VK2AGH who then relayed to W.I.C.E.N. Control VK7KC. Many thanks VK2AGH for your assistance on this occasion.

Very satisfactory 6 metre communication via Mt. Rumney relay to W.I.C.E.N. thence C.D. Hq. was established soon after this and a considerable amount of Police and general distress traffic passed. While this was going on further traffic was coming back through the Mt. Rumney link into W.I.C.E.N. Control from four mobiles in the Carlton to Tasman Peninsula area—the first news back into C.D. Hq. from there since the fires cut the telephone lines into the area.

All mobiles were recalled from their areas at 2225 hrs. and the Mt. Rumney link closed as soon as all units were

to W.I.C.E.N. Control was installed, leaving 6 metres for use on inward traffic from mobiles to the relay station only. A second operator then put it down to W.I.C.E.N. Control via 2 metres. This, of course, doubled the traffic handling capability of the Mt. Rumney relay.

All v.h.f. distress traffic units and h.f. personal third party units closed by approximately 0100 on 10th February to allow the operators and gear to cool down for a few hours as traffic had slowed to a mere trickle at that time. All channels were again opened by approx. 0815 hrs. with an extra link, this time point to point via h.f. (3590 Kc.) between Richmond and Colebrook—again to be the sole communication link available. Units at both towns were also equipped with 6 metre mobile equipment which was used to relay via Mt. Rumney back to W.I.C.E.N. Control and C.D. Hq. when QRM or QRN prevented direct reception of 3590 Kc. traffic at W.I.C.E.N. Control. This meant virtually all the time in daylight hours as the h.f. equipment was QRF d.c. operated a.m. gear which was replaced as demand proved the necessity on 13th February by high power sideband transceivers on the 3590 Kc. channel powered by petrol

In view of the predicted high fire risk in Northern Tasmania, the Mt. Wellington link also established a link through to Mike VK7ZMC/M on Mt. Barrow in the north on 53.035 Mc. net frequency, again with patch facilities available to W.I.C.E.N. or C.D., in case it became necessary to use it.

With the sophisticated monitoring and patch relay systems installed on Mt. Wellington, the relay on Mt. Rumney became largely redundant and was closed down, after being almost continuously manned for four days, at approx. 2000 hrs. on 11th. During this time almost all operation was on batteries as the 240v. a.c. supply was cut very early by fire on 7th. D.C.A. personnel did allow our operators to borrow 240v. a.c. from their emergency set on Mt. Rumney spasmodically.

#### MOBILE UNITS WITHDRAWN

By 1900 hours on the 12th, all mobile units had been withdrawn as their services were no longer required, but the portable units at Colebrook and Richmond were still very active with point to point traffic on h.f., with Richmond now having telephone facilities into Hobart at times. Mt. Wellington remained open until 1800 hours on 13th for relay from these stations should

telephones fail again, as was occurring frequently prior to this.

Thus things drew slowly to a close at 1800 hours on February 14 when all links were closed as services were largely restored and our assistance was no longer required, although an Army unit borrowed much of the equipment on Mt. Wellington for their use in a station they set up there.

Many questions arise at the conclusion of such an operation. Thanks are due to many. It appears to me to be a risky procedure to attempt to single out more individuals than has already been done, however the work of Lee and the team of very willing workers who assisted at W.I.C.E.N. Control (VK7KC) and of Lee's XYL who fed goodness knows how many people each day and put up with so many relative strangers in and around the home for a full week must be acknowledged with thanks.

The key to the entire operational success was the enthusiasm and selflessness of the operators and assistants of the 22 6 metre mobile stations used at some stage during the operation and who proved, for the first time, the extreme versatility and utility of 6 metre net operation in W.I.C.E.N. work, while the whole competence of the communications was rounded off by the support of the 10 or so h.f. mobile and portable stations which did such good work in providing fixed point to point services. The added 2 metre relay and patch facility boosted the total traffic capacity of the system by 100%. Backing the whole emergency operation were many Associate W.I.A. members and

even friends of Amateurs who assisted throughout as scribes and of course the h.f. home station operators throughout Australia who helped wherever they possibly could in every respect.

One hopes that the authorities will now realise and recognise, at least in some part, the high potential value of our mobile "fleet" when coupled with the normal fixed station network already in existence, during any state of civil emergency such as that just past.

#### LESSONS LEARNED

In retrospect, what did W.I.C.E.N. achieve and how fast once the situation became one of extreme emergency? Well quite spontaneously a 6 metre mobile net controlled first from the Fire Brigade Headquarters and later from near THT studios was operative within the hour of the state of emergency being proclaimed. Within a further 3 hours the 6 metre mobile network was under W.I.C.E.N. Control from VK7KC's establishment, using the call VK7ZKJ, and the whole system was integrated into supplying situation reports to Civil Defence Hq. by an h.f. (3590 Kc.) link from VK7KC to VK7EB. Civil Defence in turn had personnel and serviceable telephone outlets for distribution of traffic sent in by W.I.C.E.N. to their Hq.

The speed with which W.I.C.E.N. got so thoroughly organised was a tribute to those Amateurs concerned, and demonstrated once again the need for radio as a back up for line communications. Here the telephone proved to be extremely vulnerable under the circumstances.

What else did we learn as a result of our activity? First and foremost we found out that the v.h.f. mobiles, assisted by relay stations, could cover the entire disaster area for traffic or situation reporting and apart from the availability at very short notice of so many mobile units (approx. 25) around Hobart, the 53 Mc. net frequency was not subjected to QRM from fellow Amateurs not involved in the emergency. Further, that when backed up by 2 metre portable or mobile, a 6 metre relay station could really handle traffic by using one frequency for inward and one for outward traffic simultaneously.

What did we need? First and foremost direct telephone lines to both C.D. and Police Hq. from W.I.C.E.N. Control, to leave yet another channel clear (i.e. 3590 Kc.) for emergency traffic and as a standby channel should all traffic lines go out. Secondly, and most important, W.I.C.E.N. requires a permanent headquarters on perhaps W.I.A. property with permanent installations of v.h.f. and h.f. equipment; direct telephones as mentioned before; ample space to park up to 25 mobile units on standby; a substantial petrol dump (bulk), and a supply of four-gallon or thereabouts containers for mobiles use; auxiliary generating set; several battery chargers, and sleeping and cooking accommodation for at least three operators.

Well that seems about the story as I saw it from the very early stages of the emergency and although I hope never to see another such emergency, the experience with W.I.C.E.N. was a most valuable one.

## \*AEGIS COILS The QUALITY'S Wound In!



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# A SYNTHETIC BATTERY FOR YOUR CARPHONE

(or how to make Transistor Regulated Power Supplies)

## PART TWO

RODNEY CHAMPNESS,\* VK3UG

As promised, here is some information on a higher current rating 6 to 22 volt regulated power supply. The previous two supplies (described in Part One, "A.R.", Feb. 1967) could produce only up to 12 amps, and this only at an intermittent rating. The supply described in this article will put out 15 to 16 amps, quite comfortably for periods up to half an hour at a voltage output of 13.5 volts, and put out continuously 10 amps. At voltages higher than about 13.5v, the current available is reduced as the average voltage across C6 is reduced as the current increases and vice-versa.

The circuit in diagram one is very similar to the second supply in the previous article with a few circuitry changes. This supply is not capable of such high output voltages (22 volts max.) as the previous one, which will supply up to and slightly over 30 volts at low loads. This previous one is, therefore, possibly more suitable to supply power to quite a lot of mains-operated transistorised gear. These in many cases use in excess of 20 volts.

There are two pilot lights, one to indicate normal operation and the other to indicate an overload condition. The output transistors have been increased by one to four and there are two Ferris 7003 heat sinks with these transistors mounted on them. There are now two output controls, one is preset on 13.5 volts and the other is a variable coming out to the front panel.

\* 14 Buckley St., Sale, Vic.

I have shown an amp. meter and a volt meter in the circuit; the amp. meter is possibly not essential, although handy; the volt meter I feel is quite essential if variable output voltage is to be used. It is not always convenient to use an external volt meter for this purpose. The variable voltage output control can, of course, be approximately calibrated and for most purposes would be quite adequate, so please yourself on this.

R19 is an additional resistance, fitted so that a 12 volt battery can be safely charged at a maximum rate of between 10 to 12amps, which will automatically taper off to a trickle charge when the battery reaches full charge. This I think you will agree is a handy addition to the unit. R19 is a bit of a problem and about the only way out of it is to use four 1 ohm 10 watt resistors in parallel.

The continuous output current of the supply is limited to about 10 amps. (the rating of the transformer), although it supplies 15 amps. with no qualms. To boost the continuous output current rating, a 4 amp. 17 volt transformer of the type used in the smaller power supply in the previous article could be wired in parallel, so giving a continuous rating of 14 amps. The size of R19 could be reduced then to about 0.2 ohm, and would consist of five 1 ohm resistors in parallel.

Now to charge a flat 12 volt battery to a terminal voltage of say 14 volts, at a maximum current of say 12 amps., we will need a resistance in series with

our flat battery to limit the current flow and charge rate, otherwise the overload circuits would most likely operate and the battery certainly would not charge. A flat battery should not be flatter than 11 volts. Now we have a 3 volt difference between the voltage of the supply and the battery, so a resistance is inserted between supply and battery to limit the maximum current. Using Ohms Law:  $E = I \cdot R$ , then 3 volts  $\div$  12 amps. = 0.25 ohm. Therefore the series resistance is 0.25 ohm.

At the beginning of the charge the current is 12 amps., but when the battery reaches 12 volts the charge drops to 8 amps.; when the voltage rises to 13 volts the charge rate has dropped to 4 amps., and when the battery voltage has risen to 14 volts (the supply voltage) there is no charge although in actual fact there will be a small trickle charge. We now have a tapered-charge battery charger, and so the motto is "set it and forget it".

As can be seen, the circuit is virtually identical with the previous one. The main differences are in some component values due to the different voltages and currents put out. It would be quite possible to fit an additional 4 amp. transformer into the supply and I have left room in mine for this addition. All the outputs go to 2-pin polarised plugs.

I had said that I would possibly incorporate a more sophisticated overload circuit, but due to circumstances mostly lack of time, I haven't developed

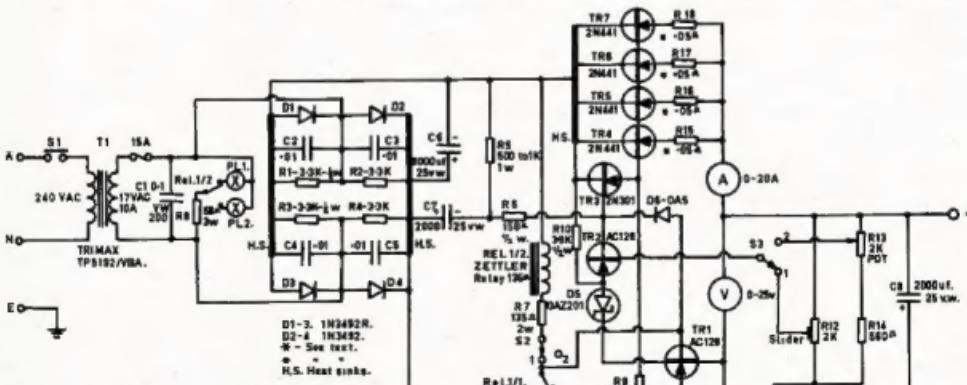


FIG.1. TRANSISTOR REGULATED POWER SUPPLY.

R11—18 B & S. enameled copper approx. 8 inches long. Adjust length for diode OA5 (D6) to conduct at pre-determined overload current between 15 and 18 amps.  
\*R15, R16, R17, R18—3 feet of 20 B & S. enameled copper wire.

S1—Mains off/on.

S2—Overload re-set: (1) normal, (2) re-set.

S3—Output volts: (1) pre-set volts (13.5v.), (2) variable volts.

When overload occurs, Zettler relay pulls pins in and changes over pilot lamps attached to Rel. 1/2, and clamps output volts to virtually zero.

these circuits. Diagram 2 will give the general idea of the circuit I had intended trying. TR1 is still the over-load control transistor but in its collector lead is just resistor R23 instead of the relay and R7. Until D6 commences conduction, TR8 and TR9 are cut-off. When D6 conducts, current flows through R20 and the voltage drop across R20 causes TR8 to conduct.

In the collector lead of TR8 is a resistor (R21) which will also have a potential difference across it. This voltage is applied to a CR network consisting of R22 and C9. Should an over-load occur, C9 will charge up to 63% of the voltage across R21 in about 3 seconds, and TR9 will gradually commence conduction during this three seconds and about this time the collector current will have risen sufficiently high to pull the over-load relay in. So with an overload only extending for a couple of seconds or so, the over-load relay won't pull in, so saving having to re-set.

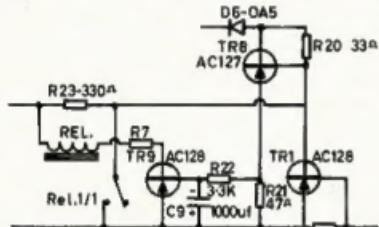


FIG. 2. OVERLOAD CIRCUIT.

Another advantage I can see is that the over-load operation of TR1 is amplified by TR8, giving a much sharper over-load cut-off characteristic as indicated by my simple graph is Diagram 3. Of course this over-load circuit may not work as well as I feel it should, but it is a starting point for experiments. I have seen much more complicated circuits for supplies of this type, using about twice as many transistors as I would suggest and a lot more complication. Note that TR8 is an NPN transistor. I have also been giving some thought to an automatically re-setting over-load circuit but have not got to the stage of being able to draw up working circuits.

The emitter resistors of TR4 to 7 are 3 feet of 26 B. & S. enamelled copper wire, and the resistor R11 consists of 18 B. & S. enamelled copper wire. The length of this is adjusted until D6 just commences to conduct at the over-load point, which in the case of this supply is between 15 to 18 amperes. For the fuse holder, don't use a panel mounting type, as I did, or you may find after high current has been drawn for a while that the ends of the fuse melt and boy, you are in trouble. I'm using a screw terminal board with two lugs as my fuse holder.

I feel I may have been in error in my previous article with my supposition as to why equalising capacitors and resistors are necessary across series

connected silicon diodes. I feel the following explanation is nearer the truth.

When the diodes are in the non-conducting state they act as small capacitors. Now say one diode has an effective capacity of 90 pF, and the second in a two-diode train has capacity of 10 pF. The p.v. of each is say 60 volts and the total theoretical p.v. is 120 volts. We apply a source of voltage which will give a p.v. of 100 volts. The diodes are safe—or are they? No, because the p.v. will distribute in inverse proportion to the capacity, therefore we have 90 volts across the 10 pF diode and 10 volts across the 90 pF diode. Puff goes number one through excess volts; when it's gone, puff goes number two, as it will probably have to take the whole load. Sounds a lot more feasible than my other explanation. The quoted capacities are not necessarily correct, they are just to illustrate the point.

Another possible explanation I have heard of is that the leakage current across the diodes in the non-conducting state causes the p.v. across the diodes to be unequal, so which is actually correct I'm not really sure. Perhaps someone with more knowhow on diodes may be able to enlighten us all, but in the meantime fit the equalising capacitors and resistors to be on the safe side.

Well that is about the lot for this article. I am hoping to write a further article on an a.c. supply for the 122 set. This will include a simpler transistor regulated 12 volt d.c. supply as well as a normal h.t. supply. At the moment I anticipate it will only use one transistor.

I hope that these two articles on transistor regulated supplies have been a starter for those who have always wanted a replacement for the lead-acid accumulator. The ripple at full load with the supply described is between 25 millivolts and 50 millivolts.

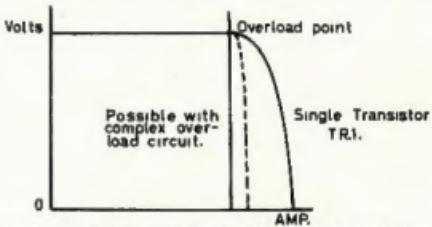


FIG. 3. POSSIBLE OVERLOAD CHARACTERISTIC OF VARIOUS OVERLOAD CIRCUITS.

## "SUPRGAIN" ANTENNAE

One of the perennial dreams of most Hams is a high-gain antenna occupying practically no space—something that will give lots and lots of decibels but be no more cumbersome than a weathervane. During the past several years, the theory of such antennae has been pretty well worked out and it is now established theoretically that any desired degree of directivity can be obtained in an antenna array less than a half wavelength long. Antennae of this sort have been termed "supergain" arrays.

No one has built such an antenna. Furthermore, it appears that no one ever will. The painful practical fact is that, considering an array of given small over-all dimensions, increasing the directivity and gain decreases the radiation resistance at a tremendous rate so that the antenna efficiency goes down very much faster than the gain goes up. In addition, the spacing between elements and phasing and amplitude distribution of the currents in them becomes impossibly critical.

In the Proceedings of the I.R.E. (N. Yar, "A Note on Super-Gain Antenna Arrays"), Proceedings of the I.R.E., Vol. 39, No. 9/9/51) treats quantitatively a particular type of array, one having a number of half-wave

elements in broadside with the array length limited to one-quarter wavelength, and comes out with some astonishing answers. With the proper current distribution between elements in each case, the power gain over a single element is almost the same as the number of elements, e.g. with five elements the power gain is approximately 5, with 9 elements the gain is nearly 9, etc., and presumably would continue to increase in the same fashion beyond the nine elements which represent the limit of the author's curves. These gains are not especially high as compared with larger antennae, but it should be noted that the broadside case considered is probably not the most favorable one for small dimensions.

From the practical standpoint, the significant thing is that the analysis shows each element of a 9-element array would have to carry a current of about 14 million amperes in order to produce a field strength, at a distant point, in the most favorable direction, equal to the field produced by a current of 19.5 milliamperes in one element alone! Practically speaking, of course, such a tremendous current would be an absurdity. Further data is given based on the calculated ohmic losses

(Continued on Page 15)

# A "CORNER" ANTENNA FOR 7 Mc.

WAL SALMON,\* VK2SA

THE success of the "corner" series phased array described by the author in "Amateur Radio," in October 1966 prompted him to think in terms of a "corner" antenna for 7 Mc., with possible harmonic relationship on 14 Mc. A number of letters were received by the author in connection with the article and several Amateurs asked for details of an antenna for 7 Mc.

The author has always held the view that it is most desirable to endeavour to get some added gain in the desired direction when planning a wire antenna and so far as 7 Mc. is concerned, the ordinary Ham living on a suburban lot cannot think in terms of Yagis or Quads for 7 Mc.

However, the shortened centre loaded dipole will fulfill most requirements so far as directivity and DX is concerned on 7 Mc. and such an antenna to fill the bill has been constructed at VK2SA and was erected on 9th October, 1966, as a vertical series array, and on 11th October was re-erected as a "corner" antenna on the 52-foot mast at VK2SA.

The antenna consists of two centre loaded dipoles fed with open wire line and spaced 20 feet apart at the dipole centres. The phasing stub is inductively loaded with 14 turns of 16 gauge enamel wire in each leg, both being wound side by side on a 1½" plastic tube (see Fig. 3). Before connection to the antenna, the stub is shorted at

one end and the free ends snipped until the g.d.o. dips at 7 Mc. The total length of the stub was then 20 feet.

The reader might ask why the stub was shortened by inductive loading. The reason was due to the fact that in order to design the "corner" antenna to fit in with space available, a scale diagram of 10 feet to 1 inch was drawn and the dipoles came out at 42 feet each and the stub 20 feet, so there are

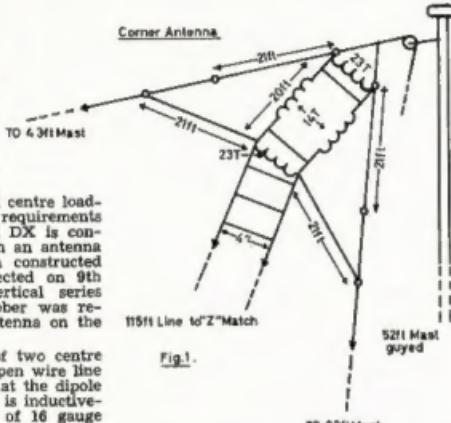


Fig. 1.



Fig. 2.—Centre loading coil in each dipole.  
77 Flora Street, Kurrawee, N.S.W.



Fig. 3.—Shortening coils for 20-ft stubs.

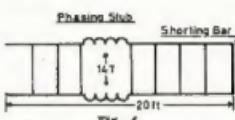


Fig. 4.

Fig. 1 shows the "corner" antenna as erected at VK2SA. Fig. 2 illustrates the centre loading coil in each dipole, and Fig. 3 shows the electrical shortening coils for the 20-foot stubs.

The stub should be dipped at 7 Mc. with one end shorted as shown in Fig. 4. On 7 Mc. the s.w.r. is 1.1 to 1, and on 14 Mc. from 1.3 to 1.5 to 1.

Using the antenna in the favoured direction of North East, S8 reports have been received from W land on a.s.b. and c.w., and a.s.b. S7 from Japan, all on 7 Mc. On 14 Mc. an a.s.b. S8 to S8 report from YV5, S7 from W, S6 from TI2. All reports were over a three-day period commencing 11th October, 1966.

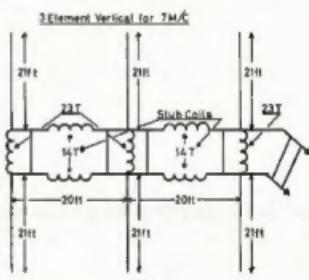


Fig. 5.

Ever heard of a three element vertical for 7 Mc.? I tried the two element for one day, but if you want to give your friends overseas something to think about, turn to Fig. 5. Just hang it from a wire broken with insulators about 45 feet high. If you really want to go to town and do the thing properly, why not use the stub line as the horizontal support between two masts and let the thing hang down in the form of three driven inverted vee antennae for 7 Mc.

Give me a call some time and let me hear the noisy brute!





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30c plus S/T 25%.

**Pack and Post** 5c each or 25c dozen.

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Secondary: 180v. tapped at 170v. at 100 mA.; 55v. at 10 mA.; 12v.-0-12v. at 130 mA.; 6.3v. at 4A.; 6.3v. at 4A.

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Primary: 12,000 ohms p.p.

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Primary: 25 ohms.

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Originally for outside broadcast use—response 30 c.p.s. to 15 Kc.

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# "THE THING"—TRANSISTORISED

## AN EXPERIMENTAL SIDEBAND EXCITER

K. A. KIMBERLEY,\* VK2PY

### PART TWO

In my previous article ("A.R." Nov. 1966) I outlined a transistorised sideband exciter. A lot of fun has been had playing around with it, as well as learning something about the behaviour of transistors in the practical sense.

The use of a 9 volt battery precluded the chance of electric shocks, but, as in valve (that's rude word today!) jobs, it is wise to switch off before making adjustments to the wiring. Transistors have an irritating habit of not liking stray a.c. currents originating from the soldering iron. Likewise shorts from the main supply rail to

Direction—All windings wound in a clockwise direction when viewed from below.

T1, T4—Primary: 80 turns, tapped at 14. Secondary: 2 turns wound over primary.

T2, T5—Primary: 2 turns wound over secondary. Secondary: 40 plus 40 bifilar

T3—Primary: 80 turns. Secondary: 7 turns wound over primary.

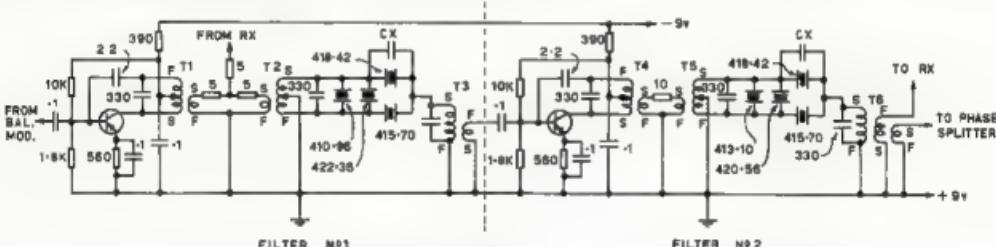
T6—Primary: 80 turns. Secondary (1): 7 turns wound over primary; secondary (2): 7 turn wound last.

Note: Coil data for alignment oscillator will be given later.

90° from the can side and soldered on to the appropriate eyelet.

It will be noticed that the earth (pos.) rail runs down one edge whilst the neg. supply rail along the other. All wiring is done in stretched 20 gauge tinned copper and should be positioned as in diagram. The filter is built into a shielded box 6½" (long) x 2½" (wide) x 2½" (high), open at top and bottom.

The crystals could be mounted in special sockets or metal valve sockets, however these also cost money so I used the hint as shown on the front cover of a back issue of "A.R." (Oct. 1963).

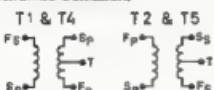


base kills them faster than one can say "B——it." I know! I found out the hard way.

### THE FILTER

I hope the preamble has been short enough as there is a lot of meat to follow. As one would imagine the filter is really the heart of this project so therefore some care should be taken during its construction. Have a good look at the circuit and layout drawings before commencing.

### WINDING DATA FOR FILTER I.F. TRANSFORMERS



### FILTER TRANSFORMER DETAILS

Formers—Ducon miniature i.f. assemblies  
Wire—34 gauge B. & S., posy covered wire

### MECHANICAL DETAILS

Figs. 2 and 3 are drawn to scale and should be a guide as to the manner in which my filter was constructed. For the base board I used scrap 1/16" laminex. Alternatively, 1/16" bakelite or matrix board (this costs money, however) could be used with equal success.

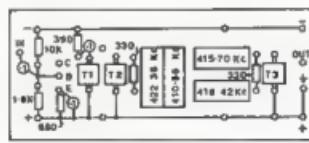


FIG. 2

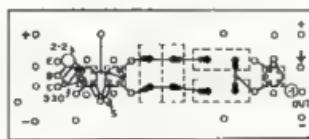


FIG. 3

The base board is drilled and fitted with tubular eyelets where indicated by the small circles. The eyelets serve as component mounts and wiring (solder) points. The mounting tags on the i.f. transformer cans are bent to

### ELECTRICAL DETAILS

The filter consists of two identical half lattice sections connected in cascade. The use of this circuit configuration does not imply superiority over others, but rather the limitations of my junk box.

All transformers were wound on Ducon i.f. transformer assemblies, using 34 gauge self-fluxing wire. T2 and T4 are bifilar wound. However commercial transformers could be used if desired, after mods. as follows: Remove tuning capacitor and replace with two series connected capacitors of double original unit. The centre tap so formed now connects to earth in lieu of coil tap as used in my filter.

Coupling between T1 and T2 is controlled by means of the five ohm resistors, as per circuit, and is not critical. These resistors will make up an isolating pad when the proposed receiver section is added.

Transformers T3 and T6 are matching transformers to couple the high impedance filter into the base of the transistor amplifier. In aligning the filter these transformers are purposely tuned away from resonance, thus vastly improving the filter pass band curve. I imagine this comes about as a result of the impedance of a parallel LC circuit reduces as it moves away from resonance and hence reaching a point where an optimum terminating impedance is presented to the output of the filter proper.

As mentioned in a previous article, the amplifier stages may not be needed

\* 5 Don Street, Newtown, N.S.W.

in a straight exciter. However, as they could be required for receiving, it was decided that it would be easier to install them now than later. The gain requirements here are low, so it could be wiser to connect the transistors in common base rather than common emitter. This circuit configuration has a lower gain and hence reduces the chance of "take off".

The components used are:-

Resistors— $\frac{1}{2}$  watt 20%.

Capacitors—All 0.1  $\mu F$ . are 25v. ceramic (Ducon Redcap).

330 pF. are 5% 125v. styro-seals.

2.2 pF. are ceramic NPO discs.

Cx gimmicks (approx. 1 to 3 pF.).

Transformers—Wound on Ducon if. transformer assemblies.

Transistors—PNP germanium types, similar to OC45, etc.

Base Board—1/16" laminates or bakelite, drilled and eyeleted as required.

Crystals—Two digit series as per text.

The crystals used at VK2PY are of the two digit series and centered around 417 Kc. Crystals at other frequencies would be equally suited provided that the tuning capacitors across the if. transformers were altered accordingly. Unfortunately, the use of crystals one channel apart results in the bandwidth being too narrow and, of course, as "Finnagle" would have it, two channels apart the filter is too wide with a nasty dip in the middle.

This leaves us with several alternatives:-

- (1) Make do with a narrow filter.
- (2) Use crystals from the three digit series conjointly with those of the two digit series.
- (3) Adjust the frequencies of my existing two digit series.
- (4) Purchase a mechanical filter?

Again my "Scotch blood" came to the fore, thereby making alternative number 3 an automatic choice. Later I was pleased with this solution as it enabled me to learn something about shifting crystal frequencies. A short description of this will be found later in the article.

## ALIGNMENT

The following procedure is included for those Amateurs who do not have a sweep generator. Those fellows who have one will need no instruction from me in the use of their own equipment. I found mine invaluable and would not now dream of aligning any receiver without it.

The following items will be necessary:-

- (1) Bandspread stable oscillator.
- (2) Suitable detector.

It would be highly desirable to have:-

- (3) C.r.o.
- (4) Sweep generator.

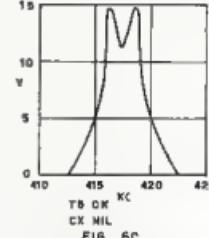
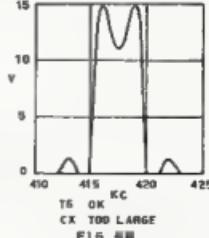
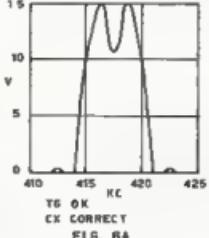
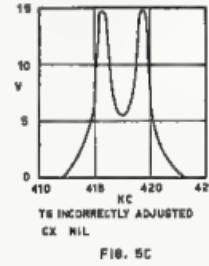
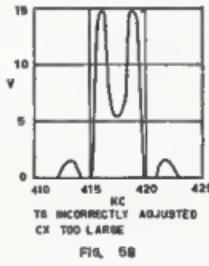
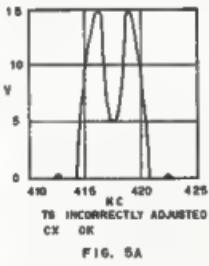
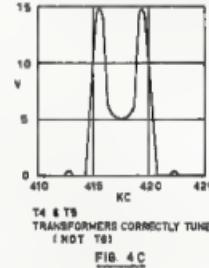
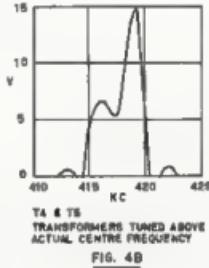
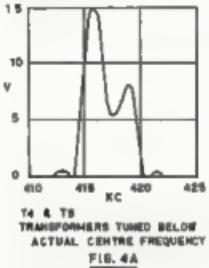
If you do not have access to (3) and (4) then you will most certainly need:

- (5) Patience.
- (6) Perseverance.

Some comments and constructional ideas will be given regarding items (1), (2), (3) and (4) at the end of this article.

Proceed as follows: Connect the detector at the output of the filter. Set generator to the mid frequency of crystals 1 and 2 and connect to the top of T5. Keeping detector set on most sensitive range, adjust generator output to give small reading. Peak T6, reducing generator output if necessary. Move generator to T4 and peak T5 in a like manner. Proceed backwards towards the input as if aligning a receiver. Beware of overload as this condition can make the pass band curve appear to be far better than it is.

We now have to obtain some idea of the pass band curve. Of course if you have a sweep generator this exercise will be a piece of cake, however failing the ownership of same, proceed as follows: Rock your signal generator backwards and forwards over a range of about  $\pm 5$  Kc. from the expected centre frequency of your filter. Whilst doing this keep a sharp eye on the gatings of the null detector meter. At this stage don't be alarmed at the variations in meter readings. Remember that a reading equal to half of the peak voltage reading represents a loss of only 6 db.



The reader will be surprised how quickly a mental picture of the pass band shape is built up in the mind. Most probably it will look something like those pictured herewith. Figs. 4A and 4B indicate that you have not aligned the if's at the correct centre frequency. Note the exaggerated peaks corresponding with (Fig. 4A) the lower frequency crystal and (Fig. 4B) the higher frequency crystal. If you are lucky and have correctly picked the centre frequency, Fig. 4C will be produced, but could have large or small "pop ups" (side lobes). Remember that these curves are voltage versus frequency and will look a whole lot worse than curves expressed in db.

Having so far given a fair exhibition of your patience, you will now need to bring your perseverance to the fore. Disconnect filter No. 1 and feed signal into the base of the second transistor via the 0.1  $\mu F$ . capacitor. Whilst still rocking and watching carefully, re-adjust T4 and T5 until the pass band looks something like those shown in Figs. 5A, 5B or 5C. Having finally succeeded in making the two peaks symmetrical, I would strongly advise

the constructor to give it away for a while. Have a beer and a smoke or even a cup of coffee or some other kind of relaxation.

When fully refreshed, it is time to tackle T6 and this should be adjusted with even more care than any of the previous adjustments. Very small changes in tuning are all that is necessary here. Dramatic changes in the pass band curve will be observed during the adjustment. If an excessive peak becomes evident on either edge of the curve, a slight fiddle with cores in T4, T5 and T6 will soon put things right. In other words you will probably gather that there is a little interaction between adjustments. Eventually everything comes good and the curve should look something like those shown in Figs. 6A, 6B and 6C. The middle dip should be about 0.53 of the peak reading, corresponding to -1.8 db or better, but should not be deeper than 0.79 (-2.0 db).

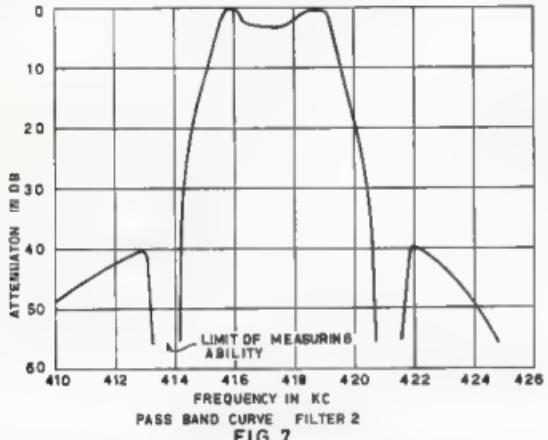


FIG. 7

Please Note that these curves have been exaggerated somewhat to show more clearly how Cx controls the "pop ups" as well as the steepness of the sides. Generally more Cx increases the level of the "pop ups" and at the same time the sides of the filter become steeper.

It is now advisable to draw an accurate curve with the attenuation in db. Fig. 7 is the actual pass band curve of my filter No. 2. Commence by adjusting the detector so that it reads full scale at the peak of the pass band curve and call this the 0 db ref. point. Slowly move generator frequency until the detector output meter now reads 0.71 of full scale and note frequency. Mark this in on your graph as the -3 db point. Continue the frequency shift in same direction until the meter now reads half scale. This is the -6 db point for your curve. Likewise, 0.31 f.s.d. = -10 db, and 0.1 f.s.d. = -20 db. At this point it is wise to change the detector to a range that is 10 times more sensitive than the previous scale

in use. Full scale here is -20 db, 0.31 - -30 db, and 0.1 - -40 db on this scale. From the -40 db point on, measurements become somewhat difficult, however they are not really important. The 0.05 f.s.d. is at -16 db, then guess at 0.01 f.s.d. as this equals -60 db.

So much for the main lobe, keep on with the frequency shift and you will find that the meter reading will show a minor increase. This is a "pop up" and should not be more than 0.15 f.s.d. on the second scale (-38 db). Follow the same procedure for the side of the curve. If intermediate values are required for your curve, the formula to be used for calculating them is:-

$$db = 20 \log_{10} \frac{E_1}{E_2}$$

where E1 is the full scale reading that you set as your zero ref. point.

If the curve is unsatisfactory a slight titivation of the cores should correct

be okay as the attenuation figures add arithmetically, i.e. the "pop ups" will be down a total of 60 to 70 db. That's a ratio of 1,000:1 or so!

Well chaps, the foregoing certainly sounds labourious as indeed the filter alignment, without a sweep, actually is. For those without the patience or, who cannot obtain the necessary crystals, do not overlook the idea of completing the exciter by the use of a mechanical filter.

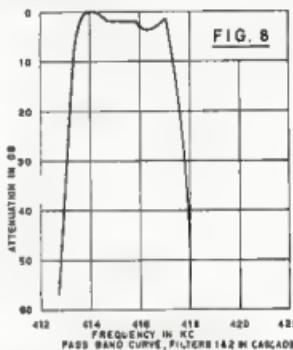


FIG. 8

There are many suitable mechanical filters on the Australian market and because of their small size as well as electrical parameters should be ideal.

Best of luck and good fun.

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Coy. Pty. Ltd.,  
348 Victoria Road,  
Rydalmer, N.S.W.

# TRANSISTORISED B.F.O.

The b.f.o. circuit shown here can be used in new equipment, or as an add-on unit to an existing unit. Its main advantage is that no variable capacitor, as such, is used for tuning. Instead, the change in base-collector junction capacitance due to variations in the collector-base voltage is utilised, thus enabling a potentiometer to be used as the tuning control.

As there is only d.c. on the leads to the potentiometer, the oscillator may be fitted anywhere on the chassis, with long leads to the front panel causing no problem. In cases where it is desired to fit it in an existing unit, quite often an existing potentiometer, e.g. audio gain control, can be replaced by a dual concentric potentiometer in the same mounting hole. If it is required, a potentiometer with on/off switch can be used, the switch being used for b.f.o. on/off.

It might be pointed out that the 2N708 transistor was used as it was

the first out of the junk box. In point of fact, the poorer quality germanium transistors exhibit a greater tuning range due to their higher initial junction capacitance, however  $\pm 3$  Kc. was obtainable very easily at 500 Kc. using the 2N708. About the only real re-

quirement is that the transistor chosen will oscillate at the frequency being used. The output amplitude remains constant over the tuning range. Frequency stability is reasonable, excessive ambient temperature causing an increase in leakage current, being the main cause of drift.

The operation of the circuit is fairly simple. Feedback from collector to emitter via the tuned if transformer causes oscillation, the frequency being determined by the value of L1, C1 and C2 which is effectively in parallel with C1. As VR1 is varied, the change in base voltage causes a change in base current, and consequently a change in the collector current. The change in collector current through series resistor R2 causes a change in collector voltage, and, as pointed out earlier, a subsequent change in the junction capacitance C<sub>2a</sub>, similar in effect to the operation of a varactor diode.

Further details of this effect can be found in G.E. Transistor Manual, 7th edition, pages 20 and 21, 65.

—Douglas W. Rickard, VK2ZDI

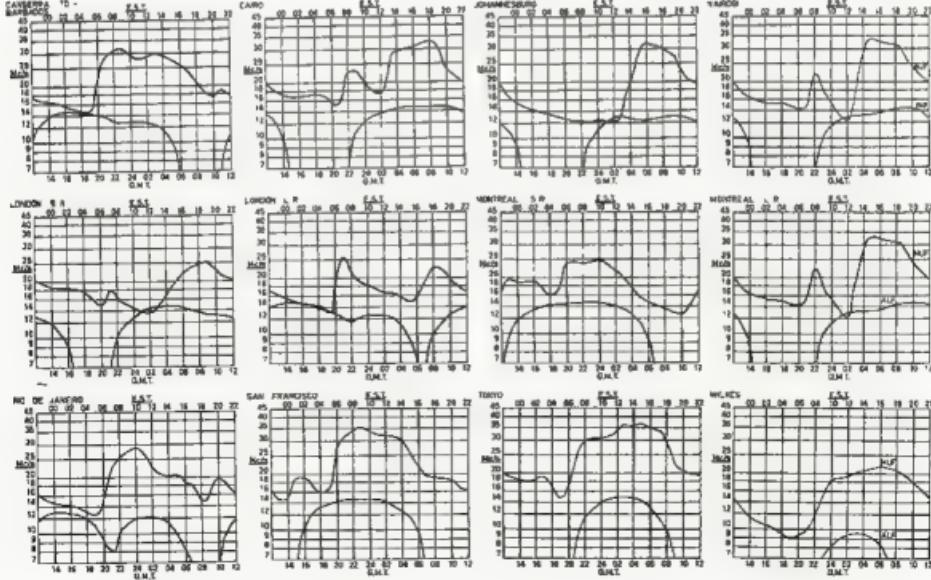


Q1—2N708 or any transistor similar.  
T1—IF Transformer, e.g. 455 Kc. (transistor type). May include C1.  
VR1—8K ohm potentiometer.  
R1—10K ohm, V.W.  
R2—4.7K ohm, V.W.  
R3—1K ohm, V.W.  
R4—470 ohm, V.W.  
R5—1K ohm, V.W.  
C1—May be part of T1.  
C2—0.1 uF, paper.  
C3—0.1 uF, paper.  
C4—0.1 uF, mica.  
C5—100 pF, mica.

## AMATEUR FREQUENCIES:

ONLY THE STRONG GO ON—  
SO SHOULD A LOT MORE  
AMATEURS!

## PREDICTION CHARTS FOR APRIL 1967



(Prediction Charts by courtesy of Ionospheric Prediction Service)

# SIDE BAND

Sub-Editor: PHIL WILLIAMS, VK3NN

The notes this month will be not very technical, as time for the necessary research has not been available. Instead, I shall quote some items of interest from my reading of overseas periodicals, all relevant on the sideband scene.

## ANOTHER U.K. TRANSCEIVER

One transceiver which I did not mention in my review of the salient features of these items 15 months ago was the "Anglian 100" made by Light Electro-Developments Ltd., in Suffolk, England. This has been modified recently to increase its power output to the 400 watts p.e.p. allowed by the British licence.

The equipment uses the 2.1 kc. mechanical filter for sideband generation at 455 kc. Frequency coverage of 500 kc. per band on two selectable v.f.o.'s in the same slide-rule dial permits transceive with U.S. stations operating on different segments of the bands. There are eight half-megacycle sections, the lowest 1.0 to 2.0, and the highest 29.0-29.5 Mc. For c.w. men a half-lattice filter is added for improved selectivity on "receive".

The p.a. has four valves, type TT21, in parallel. These are the transmitting version of the audio tube, the KT88, so popular with the bass-guitar crew in the amplifiers they use to wrench voice coils off the woofer speaker cones. The box is 18" x 8" x 15" of wrap around case construction, a la Collins, with a matching power unit 8" x 8" x 15". This description was condensed from the "R.S.G.B. Bulletin" for December 1968 if you want to read more.

These descriptions are valuable for ideas for home constructors, and I must admit to having second thoughts about a few items for incorporation in my long-minded project, the transistorised s.s.b. transceiver.

## FIELD-EFFECT TRANSISTORS

Following on the success of that little handful of receiver, the "Davco," recently reviewed in the American magazines, there are several small receivers under construction in this country. Small prefabricated modules are available. There is a beautiful little 3 watt audio amplifier little larger than a matchbox which feeds an 8 ohm speaker directly, and is ideal for the project. Integrated circuits—all moulded into the one chip will give all the gain you can use after the main filter, in one stage at 455 kc., and perhaps two stages, gain controlled, at 90 Mc. For the front end of the receiver there are quite a number of field-effect transistors suitable for use up to 30 Mc. with minimum cross-modulation with quite strong local signals. With a strong b.c. station (50 kW.) just over the back

fence, the use of transistors requires more than normal selectivity in the input circuits.

A little over a year ago, imported FET's were more expensive than many of us care to contemplate, but now some audio types are available very reasonably in this country. This has had the effect of increasing the duty on imported v.h.f. types which are not, as yet, available from Australian sources. The "customs" should learn to distinguish between various types and applications of equipment.

One can only hope that some v.h.f. type FET's are soon available locally from those who are "protected" by the higher duty rates. The situation should then "right" itself as far as we poor experimenters are concerned.

## FIELD-EFFECT VALVE

"CQ" magazine draws attention to the development of this device by (I think) Amperex in U.S.A. It is obviously in the experimental stage only, but has extremely high power sensitivity and linearity, so with a few hundred milliwatts from a fully transistorised exciter it should be possible to produce a high p.e.p. output of s.s.b. in the single tube amplifier.

I am awaiting more news of this one with anticipation. The very high-powered transistors are not yet, it seems, for Amateurs, except for the lucky ones who have access to the "just outside" rejects. Too much optimism may be unwise, for the price of the F.E. valve may be a shock to the system.

## HEATER/CATHODE EMISSION

We have used oxide cathodes in valves for as long as I can remember, back around 1930. These were a considerable improvement on previous emitters, and more easily managed than even modern thiovated tungsten emitters in modern tubes. In the Jan. 1967 issue of the "Scientific American" magazine there is a reference on page 59 to work done to improve the emission of cathodes. This refers briefly to the development from fundamental principles, of the dispenser-type cathode, in which the necessary barium is not contained in the surface oxide layer, but in a chamber with a porous tungsten "lid". This separates the emitting surface from the barium, resulting in higher emission at lower temperatures and much longer life of the emitter.

Figures of up to 40 amperes per square centimeter are quoted, with a life of 100,000 hours at 1 ampere per sq. cm. Since high peak emission is one of the features required for linear amplifier valves for s.s.b. p.a. stages, we can look forward to some interesting developments.

## NEW CALL SIGNS

DECEMBER 1968

VK3HII—H. G. Bell, 53 Valley Cres., Campbell.  
 VK3IJF—J. G. Fricker, 27 Peyton St., Hughes.  
 VK3IWT—W. R. Taylor, 13 White Cres., Campbell.  
 VK3ZAM—B. C. Elliott, 37 Ingallina St., Garvan.  
 VK3EXX—T. A. H. Hennessy, 22A New Ellawarra Rd., Bexley North.  
 VK3IAH—H. Wasm, 1 Cannons Pde., Ferntree Gully.  
 VK3AKH—K. W. Riding, 78 Alexandra St., Drummoyne.  
 VK3EJL—J. J. Mirdas, 53 Plateau Rd., Springwood.  
 VK3BDF—D. Freemantle, 13 MacNamara Ave., Concord.  
 VK3EGL—S. G. Leslieham, 2/81 Arcadia St., Coogee.  
 VK3MMH—J. Freeman, 30 Nymbla St., South Coogee.  
 VK3BNF—V. V. Flinnery, G.P.O. Hostel, Bradleys St., Cooma.  
 VK3BPO—P. Gossard, 44 Cabbage Tree Lane, Fairymeadow.  
 VK3EZR—R. F. A. Lopez, 49 Desborough St., St. Marys.  
 VK3BSS—North Shore Radio Club, C/o. 11 Hurst St., Mosman.  
 VK3EZO—J. T. Hibberd, 31 Makim St., Dee Why.  
 VK3GZY—R. J. Glover, 30 Saltash St., Yagoona.  
 VK3EKL—D. L. Price, 333 Lakemba St., Lakemba.  
 VK3ZQB—J. C. Bedford, Station 12 Cumberland St., Teronga. Postal: C/o. Mrs. W. Smith, Carrington St., Singleton.  
 VK3ZSU—J. D. S. Patterson, 1200 Pittwater Rd., Mobile: Postal, P.O. Box 130, Dargan.  
 VK3ZXB—P. R. Cairns, 8 Scarborough St., Kogarah.  
 VK3EL—G. J. Marson, 26 Darling St., Moonee Ponds.  
 VK3JQQ—R. N. Roark, 50 Churchill St. Mount Albert.  
 VK3AMG—J. M. Barry, Station: Portable; C/o. C.R.A.E., 88 Collins St., Melbourne.  
 VK3AVI—Royal Victorian Institute for the Blind (15th Box 100 Boy Scout Group), Burwood Rd., Burwood.  
 VK3ZQH—R. Patterson, 33 Calimbernes Ave., Oakleigh.  
 VK3ESV—D. Chick, 15 Vida St., Essendon.  
 VK3UW—J. O. Lascaris, 1 Maria Cr., Glen Waverley.  
 VK3EZU—A. B. Duck, 25 Main Cr., North Blackburn.  
 VK3ZXR—A. G. Williams, 31 Wilkinson St., Reservoir.  
 VK3ZYB—W. M. Alsop, 3 Menin Rd., Nunawading.  
 VK3ZYC—R. A. Goodwin, Postal: P.O. Box 61, Kaniva.  
 VK4MKM—M. T. K. Power, 9 Railway St., Burndale.  
 VK4WN—J. G. Willis, 208 Wardell St., Enoggera.  
 VK4ZT—N. Sandford, 18 Loch St., Toowoonba.  
 VK4ZCW—C. W. Bruce, 13 Sims St., Toowoonba.  
 VK4ZER—P. J. Fitzherbert, Station: Portable; Postal: Radio Section, 10 Sqn., R.A.A.F., Townsville.  
 VK4ZZE—S. S. Elkin, Station: Portable; Postal: 183 St. L., Bundaberg.  
 VK3STQ—P. J. Gordon, 7 Rawlings Ave., Tarenville.  
 VK4TU—J. Kitchen, Station: 44 Green Ave., Antill Hill. Postal: 23 Railway Pde., Midland.  
 VK3EFK—R. J. Fisher, Lot 12, Hulton St., Osborne Park.  
 VK3LS—L. A. Cooper, Berrieldale Ed., Berrieldale.  
 VK3TZR—D. R. Davis, 76 Sandy Bay, Sandy Bay.  
 VK3OX—G. D. Griffiths, Station: Portable; Postal: C/o. Mr. A. Smith, 148 York Street, Elizabeth St., Morayfield.  
 VK3AJL—L. Liley, O.T.C. Cable Station, Madang.  
 VK3HPN—P. Nantes, Station: Angus Dr., Boroko; Postal: C/o. D.C.A., P.O. Box 88, Port Moresby.  
 VK3SH—S. Silver, Lot 2, Section 4, Milnai Ave., Moroko.



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# LIGHT WAVE DX?\*

JIM SINCLAIR, VK2EJS

I have had an idea in mind for some time that light, being an electromagnetic wave of very short length, may be affected by atmospheric conditions similar to those that cause v.h.f. DX. The experiment described here is an attempt to test this theory.

I am fortunate in choice of QTH in that we have a clear view of a sea horizon and that horizon is over 40 miles away. I selected a fixed point: the head of a bolt on our tv. aerial in fact, and by measurement and calculation could set up a scale on my tower that would show the relative position of the horizon from time to time. The whole thing acted like a calibrated rifle sight grown to a 33-foot baseline so that one degree was 11.1 inch long and one minute of arc was 0.185 inch approx. I was now able to measure the relative effect from day to day, although I could still not find the absolute size of this bending.

The readings I took did vary although the variation was much smaller than I had expected. Only 10 minutes separated the two extremes that I have recorded to the present time. As one minute of arc represents about the limit of definition of my eyes, the readings I have taken can never be more than a rough guide to this effect. I have also noted long periods when haze on the horizon makes its exact position indistinct. On the other hand the thing I am looking for may exist as quite a large fixed refraction which I cannot measure.

Results so far suggest a correlation with air pressure, but not exactly. It is more that the reading is high while the barometer is rising, but drops as soon as the pressure starts to fall in a rate-of-change manner.

So far I have noticed only one result radio-wise. On the morning after the highest reading I have ever recorded, VK7 were heard in Adelaide and several of the south-eastern boys were worked at quite good strength for the first time in several months.

To test for correlation I would be interested in reports of 2 mhz activity in the coming DX season. Apart from the contacts you make, I am also interested in those you hear and also in those times when regular contacts are weaker than usual. Please, however, be honest and accurate with your signal reports otherwise you become just another statistic that does not fit.

While one obvious practical use of this effect is to predict band conditions, there is another point worth noting. If, as I suggest, light is bent by a tropospheric scatter force there is no reason why the effect should not exist on all the frequencies between 100 megacycles and 100 million megacycles; in other words, the u.h.f. microwave, and infra-red bands. 2 metres could in fact turn out to be one of the least active bands in this regard and we may be timidly probing the edge of a vast field.

\* Reprinted from "The South Australian Wireless Institute Journal," January 1957.

# A VK2 IN W-LAND

Having long had a desire to visit the U.S.A., on July 30 last I took advantages of a discount fare and Qantas Boeing VIKING started me off towards America at \$60 per head. My first Ham QSO (VK2EJS) was made on 1st April, which means I'm still in the honeymoon stage. But naturally I was keen to meet North American Amateurs for some eyeball contacts.

Digs were arranged with a friend some 25 miles out from San Francisco. My only problem was that he had a wife and children who as events turned out, I only spoke to on the telephone. At the summit of a steep hill in Lafayette, where I was staying, I could see two tall masts complete with Triband and 20 meter beams, I learned that the QTH of Ed WELLD is an tremendously enthusiastic Amateur Ed is an attorney and plans his contest activity with the thoroughness of a legal brief. His success was apparent as I heard him easily on 14 MHz in the VK2EJS winner VK-ZL Contest, etc.). His Collins S-line enabled me to make a contact with Bill VK2YB in Sydney. In addition to the Collins equipment for which Ed is well known, he had a 10 MHz transceiver, an 80 meter receiver of sentimental value and a miniature t.v. set. This latter allowed baseball and t.v. to be monitored. At 4:30 a.m., when Ed dropped me off in his Cadillac, we were only half an hour late.

One day as I was coming out of Elmar Electronics in downtown San Francisco, I saw a Ford Mustang at the curb sporting a centre loaded whip and a Ham number plate. As I passed by, the driver rolled down the window and lowered the window with a "Hi" (hot day, airconditioned car). K6 Just Doing Fine offered to take me around town and search for some odd frequency crystals I needed. Les gave us up to 10 MHz and we headed for the airport to call Harold in Los Angeles on 48 mhz sideband. Harold obliged with a phone patch to a local supplier and the crystals arrived C.O.D. a few days later. All done at 60 m.p.h. down the freeway.

Les, during his daily travels as a sales engineer, kept watch with his Drake on the Northern California emergency net. More than once he had been able to direct rescue units to the scene of an accident. We drove around the San Francisco Bay area in the Mustang, visiting many factories, including Elmac, where I met Bill VK5AL. Evenings, VK5JDF was controller on the Golden Bear Net, using up to 100 watts on 160 meters through Voice procedures on the Golden Bear and 8 p.m. Western County Cousins Net was still hot and fast, and an odd c.w. man like me was soon hot. Phone patching was commonplace. VK5DVE was a real ham, working in Concord, a Bay area suburb. Parked down in the rear corner of the trailer camp allowed an inverted Vee to straddle the back fence. It was to my advantage that his shack was a little lower than mine. He had a small portable a.m. all-band to and rx. This was typical of U.S. Hams generous hospitality. Linemas are the rage right now. To run barefoot in old hat. Even the Canadians, I found later, liked a pair of snowshoes to beat the QRM's.

After two weeks around San Francisco, a Qantas Boeing took me up to Vancouver in a single and a half hours. A month before my arrival had written about our meet at 18 p.m. on the corner of Terwilgh Avenue and Granville. As the airline dropped me off on my way into downtown Vancouver, I could see her waiting across the street. I was five hours early.

VK5JDF had asked me to look up VK7AKR. Always Kissing Blondes (Brunettes or Babes) was a real warm hearted character. He had ten kids and a Vice-rex IV on sideband (Scientific Set). He had a rare and unique certificate amongst his awards. Hard Worked All States. YL. His only VK3 cards were YLs, one being VK3AOKE. He was very proud of his even reckoning his Drake 100 watts. We sat in the rear of Vancouver and surrounding suburbs as Les took me here and there in the old Chev. wagon.

Beautiful British Columbia, as the car number plates declare, is an apt title for this lovely area. One Saturday night we called in on VK7AKR. Al had soon us sipping Silver Spring Beer (with a large u.h.f. stamp on the bottle top). Al had the Drake twins (now married) in the operating deck, with the city on his left and the mountains on his right. A.E.R.L. 40 w.p.m. c.w. certificate. When I used his bug to call a few VK3s, I had to push the weights right down to the slow end. Then I had to leave and return (due to the R.D. Committee beat me and I couldn't get a VK3 to answer me on c.w.). Al called on sideband and soon I was talking to Doug VK5PNU.

Sunday we visited VK7AKR in his beautiful home overlooking Vancouver. His KW-1, a kilowatt on a.m. and list price in less U.S.

6000, played second fiddle to a whole row of Collins desk-top units. Before I left Vancouver, Les presented me with a small Canadian flag, their new design. He had flown it from his car antenna on numerous field days sent to the U.S.A. It's on the wall of my shack now.

In 25 hours the Continental Trailways Bus took me back to San Francisco for \$1 U.S. Right down through Washington, Oregon and Northern California we had dinner at the Hostess, piled me with donuts and no chocolate. I had to leave for Sydney before my reciprocal licence came through, but when it does (there's a \$20 wait), I'll stick it up in the shack. Maybe I can use it next year.

Back in the home QTH, the old home-brew 20 watt looked pretty sick by comparison. Still tonight I just got a 578 from VK7ID. Now I'd better get up my new multiband trap antenna. Where did I get the trap? Well that's another story.

Dave VEJESKI

## "SUPERGAIN" ANTENNAE

(Continued from Page 6)

in copper elements having a diameter of 1 centimeter and operating (ratio of power radiated to power supplied) of the 9-element array would be vanishingly small—something like one billionth of a millionth of one per cent.

The calculation also shows that the efficiency is pretty close to 100 per cent, using the same type of element, when three elements or less are used. With four, it drops to a few per cent and decreases rapidly thereafter.

Although, somewhat different numerical results are to be expected in the case of the end-fire array, which is a much more common type in Amateur circles, the results mentioned above nevertheless typify the trend as an attempt is made to get more and more gain from more and more elements in a given small space. There is, it appears, no substitute for size if gain is to be secured under practical conditions. For receiving, too, the "effective area" of the antenna must be considered; this depends pretty largely on the physical size and an antenna must be big in order to intercept much of the energy of an incoming wave. As someone once expressed it, the antenna has to be big enough to "get a good grip on the ether".

—T. T. Tatham, VK2TQ

## NON-DELIVERY OF "A.R."

If you are not receiving your copy of "A.R." please follow these steps which will ensure the correct procedure is followed; any attempt to short circuit the system will only further delay matters.

Write to your Divisional Secretary advising non receipt of "A.R.", do not write to "A.R.". The Divisional Secretary should write to the Circulation Manager "A.R." P.O. Box 36, East Melbourne, C.Z. Vic., advising him of the problem. Unless this advice is received before the 8th of the month, a further month must elapse before the member can be re-instated upon the circulation list.

Please ensure that you always advise your Divisional Secretary in writing, verbal advice will not do.

# CAMP TECHNOLOGY 1967

For the third year in succession, Camp Technology was held at Mount Victoria in the Blue Mountains of N.S.W., during the Christmas holidays. Camp Technology, an enterprise rapidly growing in popularity, is sponsored by the world wide I.S.C.F. (Inter School Christian Fellowship) movement and is designed to cater for high school boys from 2nd to 5th year who might be interested in electronics or photography as a hobby or a career.

Conceived by a Sydney engineer, Camp Technology is an addition to an

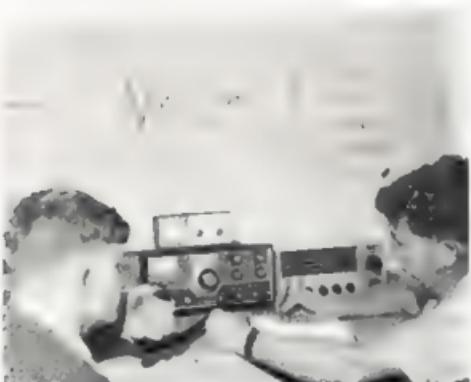
very successful erection and operation of a three element 20 metre beam. Using a Swan 350 transceiver, and operating under the Camp Technology call sign of VK2BCT, excellent contact with most parts of the world was maintained throughout the camp. One of the most interesting contacts was that with Keith VK2AKX, who was holding in Japan.

Toward the end of the camp, many of the boys sat for the elementary and junior examinations set by Youth Radio Scheme organisers of the W.I.A.

The first camp held in 1964 attracted 14 boys. For the 1966 camp, 60 applications were received and 14 applications had to be held over till next year.

All the above activities were integrated into a programme which included daily studies in the Christian faith, in which the relevancy of a personal faith in a technological age was demonstrated.

After all, "Man shall not live by bread (or even electronics) alone, but by every word that proceeds from the mouth of God".



Making a DX contact.



"The Grange", the site of Camp Technology.

already well established series of Summer Camps, which each year draw hundreds of teenagers into various types of athletic and cultural activities.

During the recent camp, 46 boys, 14 officers comprising a scientist, engineers and technicians, and a variety of electronic and photographic equipment found its way to "The Grange"—a large property at Mt. Victoria where, for nine days, the boys took part in various projects in the fields of communications, industrial electronics, computer circuits, tape recording, servicing, electronic music, and still and movie photography.

From a communications point of view, a highlight of the camp was the

## Technical Correspondence—

## ARTICLES ON TRANSISTOR TRANSMITTERS

Equipment Exchange Bulletin,  
P.O. Box 177, Sandy Bay, Tas.

Editor "A.R." Dear Sir,

I am very pleased that there were only few requests for copies of articles mentioned in my letter in Jan. "A.R.": I was dreading the flood of work anticipated. On the other hand, I am rather disappointed by the silence, if it indicates a lack of interest by Australian Radio Amateurs in transistorised circuitry for transmitters. Here, therefore, is a bit more information to spur them to greater interest in this subject.

While reviewing it I was staggered by the amount of reading I am going to have to do in detail if we are to treat it adequately in print. Several articles in the "R.S.G.B. Bulletin" make that thin magazine worth the price of the membership, and of course "73 Magazine" leads the field in America, notwithstanding its remarkable editorials (some of which sound almost reasonable).

In the following list, I should not take too seriously the plethora of transistor types specified. Items locally available from Philips/Mullard and

Fairchild ought to prove adequate for experimenters willing to study characteristic sheets and prices, not to mention the 2N2991, etc. The AUY10 and SE3035 ought to be of particular interest, but experimenters should note that the very low output impedance of the high power SE3030 will pose some serious problems of peak ratings and power transfer, which should be approached cautiously and competently.

It should be noted that useful material is also available from the "QRF Bulletin" (ref. VK2BS or WSYZE), and that a long and extensive bibliography on this subject appears in the excellent article in October 1966 issue of the "R.S.G.B. Bulletin".

Whew! If anyone knows of any more good practical references, would you please let me know this kind of information about them? In addition, there are Application Notes by Fairchild, G.E., Motorola and Philips, etc., available on request on company stationery; write first for list of titles available.

R. L. Gunther (VK7RG).

(See opposite page for a comprehensive list of references.)

## SUBSCRIPTIONS DUE

All members of the W.I.A. are reminded that annual subscriptions are now due and should be paid promptly to their Divisional Secretary. Non financial members will not receive a copy of "A.R." and back copies may not be available upon request. To preserve continuity of your files of "A.R." please pay your annual subscription now.

# ARTICLES ON TRANSISTOR TRANSMITTERS

Magazine	Date	Title or Information	Final	Input Power	Tr.	Mode	No. of Pages
"Am. Radio"	11/65	Transistor Transmitter for 144 Mc.	AF102	30 mW.	2+	Ph.	3
" "	9/66, 10/66	80 and 40 Mx Special (from "CQ," 4/66)	PADT50	20 W.	4	Cw.	3
"Break-In"	10/64	A Transistor Final Amplifier	AUY10	6.5 W.	2	Ph./Cw.	2
" "	9/66	(Debugging Modulated Transistorised Tx's)					
" "	10/66	The Behaviour of Transistors in Class C Amplitude Mod Service (a pessimistic view)					
"CQ"	9/61	75 Mx Mobile	2N1046	(Thanks to John Adams, VK3)			
" "	4/62	Zener Diode Transmitter!	IN1605	(Thanks to John Adams, VK3)			
" "	1/66	Simple R.F. Output Circuitry Design for Transistors. (good)					
" "	6/66	A Compact 40 Mx Transceiver (with a note about silicon versus germanium)					
"Electronic Circuits Handbook" (Cowan, 1963). Section 3: Four tx projects.			2 x PADT50	29 W.	4+	Cw.	6
"G.E. Transistor Manual," 7th Ed. In chap. 2, "Considerations of the Transistor's Frequency Limitations" and p. 388: Low Power A.M. Broadcast Band Xmitter plus 100 mW. V.f.c. C.w. Tx.							5
"Mobile News"	8/64	Proper Pi-Network Design.					
" "	5/66	180 Mx Transistor Transmitter	3 x AUY10	8 W.	7	Ph.	6
"QRP Club Bulletin": Good circuits appear in this from time to time. Send \$US2.00 to W9YZE for membership; it is well worth it, both in principle and practice.							
"QST"	3/66	"CQ TR" 7 Mc. M.O.P.A.	CK761	QRP	(Thanks to J.L.)		
" "	12/61	The Imp Transmitter					
" "	5/64	All Transistor 50 Mc. Phone	2N2219 (2 W.)	(Thanks to John Adams, VK3)			
" "	8/64	7 Mc.	T1486	(Thanks to John Adams, VK3)			
" "	4/66	160 Metre "Solid Status"	2 x 2N1212	36 W.	4	Cw.	5
" "	10/66	Low-Priced Premium Transistors for Amateur Applications.					
" "	11/66	A One-Watt Rig for 40 Metres	2N697, etc.	1 W.	2	Cw.	2
R.S.G.B.: "Amateur Radio Circuits Book," three transmitters, p. 86, 87, 91. Otherwise mostly valves.							
"R.S.G.B. Bulletin"	3/65	10 W. Transistor Tx for 160 Metres	2 x AUY10	10 W.	5	Ph./Cw.	3
" "	3/66	The G3SBA Top Band Transmitter (But see also p. 484 in July issue)	2 x BFY51, etc.	10 W.	4+	Ph.	6
" "	5/66	QRP Transmitter					
" "	5/66	Low Power Transistorised Transmitter	AUY10	QRP	(Thanks to VK3BT)	2	
" "	7/66	Low Power Transistorised Transmitter 160 Mx	FSP95	QRP		2	
" "		10 Mx					
" "	9/66	8 W., 160 and 80 Mx Tx by G3BIK	2 x 2N3053	8 W.	6	Ph./Cw.	1
" "	10/66	A Layman's Approach to a Simple Transistor Transmitter (excellent general article)	2N3053	4 W.	2	Cw.	7
" "	10/66	Half Watt 2 Mx Transmitter	2 x 2SC32	0.5 W.	6	Ph.	1
"Selected Semiconductor Circuits Handbook" (Wiley, 1961), chap. 4: H.F. Amps. (theory useful).							
"Transistor Radio Handbook" (Editors and Engineers, 1963), chap. 5. Theory plus ten projects							36
"Transistor Transmitters for the Amateur," by Do nStoner, W6TNS (published by Howard Sams, U.S., No. TTS-1).							
"73"	9/64	Completed 50 Mc. Station	2N2876 (2 W.)	(Thanks to John Adams, VK3)			
" "	4/65	Transistor R.F. Power Amp. Design (good)	AF102, etc.	6			3
" "	7/65	2 Metre Transistor Transceiver	2N1744, etc.	50 mW.	4+	Ph.	6
" "	8/65	Simplified Solid State: 2 Metres	3 x 2N416	5		Ph./Cw.	2
" "	9/65	Evolution of a Transistor Tx	SYL4221	1 W.	6	Cw.	6
" "	10/65	2 Metre Solid State Walkie Talkie	2N1807	120 mW.	3+	Ph.	5
" "	11/65	8 Solid Watts on 160		6 W.	3+	Ph.	3
" "	1/66	A 8 Mx Solid State Peanut Whistle (transceiver, self contained)	2N1143	400 mW.	2+	Ph.	4
" "	2/66	The Astro Ten (10 Mx)	2 x 2N697	180 mW.	3+	Ph.	3
" "	7/66	Designing Tr. R.F. Power Amps. (another good one, with complete design example at 50 Mc. and don't you dare change that to Hertzies!)					
" "	8/66	Another Solid State 2 Mx Transmitter	2N3553	QRP			5
" "	11/66	Streamlined Modulators (series)	2N3564	430 mW.	3+	Ph.	2
" "				1-2W.	2+	Ph.	2

\* Author was "Dr Shora Gitchagoomie" and was in April issue; is it a joke? The only problem is that this is exactly the same idea which was developed independently recently by one of our readers (A. Olsberg, from VK3), and a prototype was tested successfully. The idea of using the sharp back bias characteristic of a zener to amplify power does sound reasonable, and ought to be investigated further.

# Correspondence

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publishers.

## AFFRECIATION

Editor "A.R." Dear Sir,  
I wish to sincerely thank VK4AP, Rick Lake, for his technical and other assistance rendered prior to my Lord Howe Island trip in Nov. Dec. 1961. Even while I was faced with severe trouble which I experienced, Rick spared no effort to assist. His assistance was deeply appreciated.  
—Arch Hewitt, VK8XK

## EQUIVALENT FOR PADTS TRANSISTOR

Editor "A.R." Dear Sir,  
In reference to your reprinted article, "The equivalent for PADTS," I have consulted John S. Hill, the author of the article, and I have enclosed a xeroxed copy of the literature received.

The AU10 transistor which is the Phillips equivalent of PADTS is available from Phillips. These are in stock in Sydney and may be ordered through any of Phillips' distributors.

Hoping that this information may be of use to you.

—M.J. (Mike) Groth, VK5ZMO.  
[The information referred to above has been retained by "A.R." Anybody interested can contact us.—Editor.]

## IONOSPHERIC PREDICTIONS

Editor "A.R." Dear Sir,  
I am sorry to say that publishing in the January issue of "A.R." an excellent article by Frank Nine, VK5SQL, on the subject of Ionospheric Predictions.

I have been interested in this subject for quite some time and this is the first occasion that I have been able to find such a wide variety of information under one cover and written in a way that everyone can understand particularly in the matter of extracting information from the charts.

The amount of research undertaken by Mr. Nine must have been enormous and I should like to congratulate him on a most informative article.

—Warwick Johnston.

## PROPAGATION OF AMATEUR SIGNALS

Editor "A.R." Dear Sir,  
Many thanks to Mr. F. T. Nine for the excellent article in January "A.R." I hope you will consider him for another again in future and would be grateful to see him deal at greater length with shorter distance communication up to 3,000 miles. How does one choose the best frequency, and in particular what are the advantages and limitations of v.h.f. How does the W.L.C.E.N. net plan for, say, Sydney to Melbourne communication?

Also, I would be very interested in an article concerning the propagation of f.m. and a.m. under practical Amateur operating conditions, if ever you have an opportunity to enshrine a suitable author.

With many thanks for producing such an informative journal.

—E. J. Pottinger, VK6PFG.

## "THIS PARADE OF EXPERTS"

Editor "A.R." Dear Sir,  
I see in the March issue (DX Notes) that the back room boys are not passing on our opinions about the DX forecast predictions. This is strange, as just last week I was reading of an expert who had just predicted the next maximum would be the highest on record. But really, we all know that these predictions have been going on for several years now, each predicting something different. There are probably so many different predictions by now that whatever happens, someone will be right. I would suggest Mr. Editor that it would be a good move if you were to insist that any such long range forecasts you publish must come with the name of the expert in offering forward. It would be well worth while to see who is wrong. The professional forecasting services would probably offer 30 to 1 on next month's forecast and maybe 4 to 1 for a six month's forecast, and according to our own experience, the odds are just as good as they would depend on exactly what was agreed on as to the meaning of being right or wrong.

On the other hand if long range forecasts of the next maximum are maintained coming in, then the problem of "A.R.'s" finances are solved, if the experts offer better than even money. I am sure you would be happy to put

half your kitty on this week's expert at better than evens and then the other half on next week's expert who predicts the opposite, so that you make money and the experts end to be right. But if they just offer evens then save space by not publishing their "forecasts" since they themselves have no confidence in their own forecasts.

What is this deluge of predictions? Not because of radio propagation but because at this next maximum men will be going to the moon through the solar radiation. And some say something at about now, so having to decide how much radiation shielding we should carry with them. Too little for the solar maximum will cost lives, too much will cost billions of dollars or roubles wasted.

I feel sorry for this unknown decision makers trying to decide which experts guess will be best.

—Alan Head, VK5AKZ

## NEWS ITEM

Editor "A.R." Dear Sir,  
Morton Brewer, W6UJ, and Mrs. Marion Brewer will be making a visit to Australia in December 1967. The visit will only be for three weeks and he will spend about a week in Victoria.

Morton is second engineer to John Knight, W6TY, who is chief engineer of KNBC Ch. 6, Los Angeles.

John Knight was out here for a couple of weeks just prior to the Ch. 6 allocation on a survey check for one of the applicants for that channel.

—John Murray, VK5AJY.

## SUGGESTIONS

Editor "A.R." Dear Sir,  
May I suggest that publishing ideas for your already excellent magazine—

1) A Questions and Answers Column  
If a panel of experts cannot be found or co-opted to do the answering, may I suggest that readers of the journal will probably only willing to have a go and you can pick the best answers for publication.

## 2) Articles Requested List

If your readers are asked regularly to write in and talk about their hobby, articles they would like to read about, and if you published a few items requested now and then, I am sure you would find many Name who would write the articles requested.

I would like to start the ball rolling by asking the following question.

28.56 to 27.25 Mc. is one of the allotted Ham frequencies. Are there any Hams on this band, and if so when do they operate? Who are any Ham on this band please let me know?

Bob Callander, VK5AJQ

It's up to our readers.—Editor l

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# V.R.S.

One of the most interesting events for the V.R.S. in N.S.W. recently was the exhibition of gear at the W.L.A. Convention. A Dual Transistor organisation, VK1AHL and VK1AHD, is a good example of what success the V.R.S. is having and augurs well for the future. There were entrants from Postal Groups 3 and 4, Crystal Technology, the Progressive High School and Westlakes Radio Club. There were several contests held during the day, which proved very popular. The crystal set wiring contest was won by Jim Mathews in 47 seconds and the memory contest by John Swinton. On the amateur side, the Juniors section (under 14) was won by Mark du Cros for his light sensitive relay. The senior section (over 14) was won by Douglas Friend for his television set and c.t.o.

Some of the other projects on display were several 1-transistor sets, crystal sets, Morse oscillators, an electric "tic-tac-tooth" board and a television camera using a mechanical scanning device. Photo equipment, including the W.L.A. flip flop and an alarm. All in all, it was a mighty effort by the boys and by Ivan for putting everything into excellent order. It was a very hot, humid day but they did not let the enthusiasm of the boys. The team was crowded with adults as well as the boys. This is the sort of event which could help V.R.S. tremendously and it is hoped other States will follow suit in some way.

In addition, with the training of club members, V.R.S. has started a programme of supplying electronic kits-as finances become available. To date a Philips EL20 has been supplied to Sydney Teachers College Radio Club, a Philips EL20 to Mittagong Training School, an Avco 400 to Keith Howard for allocation to a suitable Hunter Valley Club, and a Gencos Kit to Clemton Park Boys' Brigade Club. Of course, this project is severely limited. V.R.S. is in a position to supply one or two more. A reasonable number of "home-made" kits have been issued to clubs on a loan basis. For example, audio oscillator kits, crystal set kits, continuity tester kits, simple telephone kits and antenna sets of various kinds have been distributed to many clubs. These kits remain V.R.S. property and are subject to recall if the club concerned fold up.

In addition, many issues of donated gear have been made. For example, Epping Boys' High School, St. George have a low power transmitter (formerly used by Bass Mill High School Radio Club), Clemton Park Boys' Brigade have an old 35Z transmitter i.c. operated and a Type 3 Mk. II etc. The gear which has been given to the local Amateur Youth Radio Club has been re-allocated. Scope soldering irons have been distributed to various clubs. This part of the V.R.S. operation is becoming a special job and a volunteer with plenty of space and time would certainly be appreciated.

In 1961 there were five clubs associated with V.R.S. In 1962 there were just on 20 in membership. Red Black, our travelling supervisor, should be congratulated on the tremendous job he has done to instigate the V.R.S. and then have it gain so fast in a comparatively short time.

Crystal Technology was very successful again this past summer with 45 in attendance, two having come from Victoria. Mr. T. Mayne, Snr., has very generously donated a Swan 305 transceiver to the Camp and with the loan of a three element beam from Antennamatic Wires, Mt. Buller, was able to work contacts from all over the world. From this standpoint, of course, Mt. Victoria is a very good choice as a spot for DX.

The Camp at Whittle of the Canberra Youth Radio Club had now received his call sign of VK1LNL and is putting out a good c.w. signal on 80 m. Len passed his A.C.C.P. last April and has been patiently waiting until he turned 16 years old in February to get the 'r' on the air. Another Canberra boy, Richard Sweet, has just received word that he passed the A.G.L.C.P. at the January examination this year and no doubt is on the air by now.

VK2? Ray Carpenter of Westlakes Radio Club has gained his A.G.L.C.P. and has received a copy of the R.E.G.R. Handbook from O.T.S. and a large box of parts from the W.L.A.

VK3: Howard Rider advises that the Victorian Division of the V.R.S. has received the club call signs of VE3ANE, and that Don Head,

VK3EJ, is responsible for the station and its operation. Slow Morse broadcasts will be conducted for members in the junior and up group very shortly.

It is also mentioned that a very attractive lapel badge for those who have gained the elementary certificate or higher would soon be available. I understand that this is to be as of March. Also, there is now an embroidered patch badge with similar enhancement jacket vest insignia. This is available now to members who have obtained the junior or higher certificates at a cost of \$1.75.

The S.W.L. Group publishes "Zero Beat" every month. It is intended that the Y.R.S. Newsletter will be included. Being an s.w.l. is very interesting and an important step in acquiring the ticket.

I would appreciate receiving news about Y.R.S. activities and would like to receive Wednesday of each month or before, if possible. Please send to Mrs. M. Swinton, P.O. Box 1, Kulurna, N.S.W. 23, Mona VE3AXR.

## Publications Committee Reports

The Publications Committee met a week earlier this month at the normal meeting night to discuss the publication of a public holiday. It is therefore possible that the annual model magazine may be by the second Monday in August.

Technical articles were received from VK5 IAU, ZLIO, ZADA, ZKZC and 488.

The story of the Hobart fire was submitted by Greville Johnston, VK7ZK. (VE3PS will please note.)

Correspondence was received from VK5 SAQ, ZFG, ZACM, ZAJY, ZAKZ, ZKZM, VUSGV and C. Christiansen.

Members have spent discussing the only item on the Federation Convention agenda of direct concern to this Committee. As we have a file on this subject it was decided to make this the basis for our contention that a new method of handling the annual mass deletions is desirable. The present method is an unreasonable state of affairs as far as our circulation manager is concerned.

We were pleased to welcome VK7KL to our meeting, when we had the opportunity to discuss with him a suggestion he made several months ago. After much discussion he had the chance to discuss his suggestion with the printer we will give the suggestion further consideration.

## W.I.A. D.X.C.C.

Listed below are the highest twelve members in each section. Position in the table is determined by the first name shown. The first number represents the participant's total countries less any credits given for deleted countries. The second number shown represents the number of DXCC credits given including deleted countries. Where totals are the same, listings will be alphabetical by call sign.

Credit for new members and those whose totals have been amended are also shown.

### PHONE

VK1AAB	214/220	VK1LJZ	206/201
VK1AHO	205/210	VK1VTL	206/201
VK1EPU	201/204	VK1VTL	204/204
VK5AB	203/214	VK3AAK	223/227
VK5MK	200/215	VK3APK	226/229
VK4PJ	217/223	VK3TSL	223/227

Amendments:

VK1AOD 184/180

### G.W.

VK1KHB	219/243	VK1AGH	278/282
VK1QL	202/215	VK1NCF	206/205
VK1RADE	201/213	VK1ARX	202/207
VK1SKK	201/212	VK1GRU	206/277
VK1XPJ	207/200	VK1XKZ	246/263
VK1AHQ	201/205	VK1TSL	206/205

Amendments:

VK1AOD 184/180

### OPEN

VK1AIGH	208/236	VK1KHO	205/206
VK1ADE	205/230	VK1KHZ	210/201
VK1ERU	203/205	VK1CAZ	210/200
VK1EPA	201/211	VK1VTL	205/205
VK1SVN	204/208	VK1JAS	212/220
VK1EPJ	202/215	VK1VTL	212/212

Amendments:

VK1AOD 184/204

# CONTESTS

## "CQ" WORLD WIDE S.S.B. CONTEST

### Prizes of Prizes

Contest period: 0000 hours GMT, 8th April to 0400 hours GMT, 9th April.

Frequencies: 3.5 to 28 Mc. (a.m. only).

Exchange: RS report plus the usual QSL, 003, etc.

Scoring: (i) Contacts between stations on different continents, 3 points; (ii) Contacts between stations on the same continent, but not in the same country, 2 points; (iii) Contacts between stations in the same country, no contact points, but count towards prefix multiplier. Multiplier: One point per prefix worked irrespective of band.

Total score is the total contact points multiplied by the sum of different prefixes worked.

Logs: Use a separate log for each band. Logs to be postmarked no later than May 18, 1967.

Address: "CQ," 14 Vanderventer Ave., Port Washington, New York 11030. Attention: W.S.B. Contests.

Awards: Certificates to highest scoring single op. station in VK for highest score on each single band and for highest all-band score.

N.B.—The full rules appear in "CQ," March, 1967, page 84.



## P.A.C.C. CONTEST 1967

### Prizes of Prizes

Contest period: 1800 hours GMT, 8th April to 0000 hours GMT, 9th April.

Frequencies: 1.8 to 30 Mc. Cross-band contacts invalid.

Logs: None, but cross-mode contacts invalid.

Exchange: RS (phone) or RST (c.w.) plus 001, 003, etc., for VK stations. PA stations will give the RS or RST plus two letters indicating their province.

Scoring: Two points for receiving a number of points for receiving confirmation of the number transmitted—thus each confirmed contact scores 3 points.

The multiplier is obtained by adding up the number of provinces worked on each band. The maximum multiplier is 18.

The final score is the QSO score for all bands multiplied by the multiplier.

Logs to be postmarked not later than 10th June, 1967, and addressed to Mr. P. V. D. Berg, PA/VE, Contest Manager, V.E.R.O.N., Keizerstraat 34, Gouda, The Netherlands.

Awards: Certificates will be awarded to the highest scorers in each VK call area for both c.w. and phone.

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# SWL

Sub-Editor: D. GRANTLEY, WIA-12022  
P.O. Box 222, Penrith, N.S.W.

Major activity for many listeners this month was the annual participation in the John Boyle Memorial Field Day. However, the year did not bring the usual amount of visitors. It was a waste of time. We are only able to score from portable stations and quite right so, but there did not seem to be great number about and less people were heard. There were little which could be logged in VK3. Nevertheless, there was some interesting operations, and I personally enjoyed the contest. For anybody trying to earn the Elizabethan DX Cluster, it would be well worth operating in the contest. Is the club station and counts for two points. Then too was the activity on 160 metres, and listeners are urged to seek QSLs for these entries, as they may well be valuable at a future date for award purposes.

For the Commercialists: Mr. Bob Stokes, the Australian representative for Trans-Worl Radio in VK3, reported that the commercial programming are not bound in this direction, transmissions from the stations in Monte Carlo and Bonnair have been reported from the country areas. These have been heard between 10 and 7.30 a.m. on the 28 m. band, but are not to be confused with a station which broadcasts political and gospel programmes on a channel close to Bonnair. Should anybody hear these programmes and care to drop me a note, I will QOF the information to Mr. Stokes.

## DX NEWS

ZLHWH, HASOKO, GSVDV, WS4WY and VA-17V, among others, received QSLs from Europe. ZLAVLN/VRL is SMOKY UAOYF in Zone 23. VRALN/VRL is reported in "Monitor" as a pirate. CTAU QSLs via Y.A.S.M.E. Box 2028, Castro Valley, Calif. The prefixes ZC and ZCZ have been applied to the special ones which have been heard recently for the Centennial year. SC replaces ZC while ZB takes over from VO.

RAAT'S is Box 229, Tigray, XELIJZ, A.P.T.O.

142, Laredo, Mexico. TBSAG, G. Valier, BP-167, L'evreille, Gabon. VPSBH/MM QSLs for W4MOM. If you have QSLs pictures or post cards, send them in. I prefer to receive them in black & white, and some of these have permission to use 10 mcs. VERICS is Zone 2. WT4QB is Zone 3, whilst WOMLY is Zone 4. HC is not an easy country for confirmation, and two possibilities are HC1RC, A.P.T.O. 388, Quito, and HC1EC, A.P.T.O. 1118, Guayaquil.

## AROUND THE SHACKS

Mae Hillard was able to hear the New Year's day breakthrough on 5 mcs, and he has been continuing the ZLs. It is good to note that Mae is striving to improve his c.w. speed, and is now at a speed which enables him to copy much of the traffic on the Amateur bands.

Here at L5922 with the ART about to undergo a test, a Philips 6 is in use. Listening mainly on 20 mcs, some interesting hits have been made on CQMF, EPRAX, 4W1L, VSBKRV, KX4QJ (Box 220, Madrid), KG6JL, VQ9KC, XW4HQ and CRML on a.s.b., whilst SWLZ, MP4BEU, ELSY, UDSRQ and FL8KA on o.w. Some European stations have been worked on 10 mcs, whilst for the first time at this QTH, signals have been heard on 160 mcs: VK3AWL/V, VK3VK/P and VK3KO, on both modes. Inwards QSLs CTAU, WS4WY, VPCLE, and various VKs for award purposes. Score here is 305/171.

Ernie Luff, L5680, is still climbing up the hand of the hill with VK3, with QSLs to hand from ID1IDU, YU1LC, YU3NFI, IIACY, IIAA, ZK1AR, WSPFK, WG1GL, ZP1GC and VR2DI, and loggings of OZ4OL, UASAO, HClM, OEP, ZL1WV, VPCLE, VPCW, VPCD, VPCB, VPCF, PASFO, PY1AEW, VPCW, FJ1AQ, SY5SY, LX1DE and many others.

Alan Raftery, L5695, has been pulling in some more QSLs, the latest being from ZK1AR, FREG, KCAUB, DJNEC, ZL5AA, YVB5QF, VK1OM, VR2EDC, DJ4UV, VK3WI, (no mcs), ZK1AR, XW4HQ, ZL1WV, VPCW, VPCD, VPCB, VPCF and VPCM/MM. Alan has been hearing some good DX, including two new countries, UL7JA and HR1KAS. His position on the DX ladder 194 heard and 74 confirmed.

By the way chaps, the QSL Ladder will not appear for another two months until I sort out a couple of problems with the Group Secretaries.

Not a listener in the regular fashion, but one of our best known VK3 Amateurs, Arnold VK5AG has asked me to mention to you that he will be pleased to QSL for correct reports sent to his QTH, Box 116, Raboul.

Reporting by tape from Northampton in the UK, my good friend Ray Mosely included in his report spoke of the DX cluster, VR2EDC in a 15 mcs QSO with a G. If you are ever wondering what Tom's signal is like at that end, rest assured that it is one of the best to get into G-land.

Talking of tapes, another interesting one was received here last week from America, where the author commented upon the most recent link in a tape received several miles away. Great interest is being shown by overseas listeners, in our activities over here.

## VICTORIAN DIVISIONAL NEWS

Any country members visiting the city during the year are reminded that there is a radio constructional night on the second Friday of each month, and the regular meetings on the last Friday of the month. Location of these meetings is at headquarters of the VK3 Division, 478 Victoria Parade, East Melbourne. Lectures have been given for the benefit of the young on a variety of subjects including Project Australia, teleprinters, f.m. equipment and signals between 30 and 200 Mc.

If you have any friends interested in radio, bring them along, and members of the Youth Radio Club Scheme are most welcome. The Group is arranging some technical visits for the next few months, and full support is required, as lack of numbers for these visits will mean that no further events will be organised. These notes have been supplied by Ian Woodward, L5005.

## AWARDS

There are many awards covered by the general title of "Islands of the Air Awards", sponsored by Geoff Wettas "DX News Sheet". They cover Africa, Antarctica, Asia, Europe, North and South America, Oceania, Alaska, British Isles, West Indies, World and DXCC, plus a yearly contest and silver cup. For full information on these awards, and lists of island groups, send four L.R.C. or six for four QSLs to Geoff Wettas, "DX News Sheet," 62 Belmont Rd., NORWICH, T.F. England, requesting the Directory of Islands. These awards etc., are available for Licensed Amateurs and S.W.L.'s alike, and are a really worthy contribution to the listeners who are anxious to gather some really fine awards.

## QSL CARDS

Once again the question of poorly filled out and inaccurate reports has arisen, due in this instance to a number of cards being returned to the Bureau. I do not propose to write a speech on how to report, and I sympathise with a new recruit to the S.W.L. ranks when

he makes a mistake, I certainly made enough, but there are a few points which occasionally need a little further emphasis.

The listener's approach is most important. The prefix "QSL" is most important. QSL for D.X.C.C. will certainly carry more weight than the often used "I want your card as you are a new country."

Another frequent error is noted where a person specifies he should, in GMT quite accidentally puts the wrong date on his report. This happens in the case of a report on a transmission made, say, at 2200z 1/3/57, and the QSL written out at one time, perhaps a week later, contains the date 2/3/57. Needless to say, the busy DX man can find an entry and the card is returned.

One instance which really showed the care from good lights. The listener in question heard a nearby DX operator working a foreign country, but could not hear the other end of the contact. However, being "smarit", he sent a QSL to the DXer, asking him to send a s.a.b. which was being used by the other half of the contact. What he did not know was that the man the QSL'd was using a.m. and had been discussing his reasons for retaining the morse code, and the poor quality of the QSL. He had not bothered to check the QSL after the initial contact had been made, and as a result not only he, but his local club, heard quite a bit about it after the QSL had reached its destination.

My desk calendar very aptly puts it. "The smarit soon amarts for his smartness."

It pays to check every QSO which you intend to QSL, for quite often you may be able to add something to your report which will be of help to the station in question. The "smarit" is, I am sure, an aspect of the subject of reporting on which you are not clear, there are many experienced S.W.L.'s who are only too willing to assist you to the best of their ability, and I am sure that any listener who appears on the DX ladder will be anxious to pass his experience on, and to do what he can to keep the standard of reporting high.

## DX LADDER

As I mentioned earlier, the full DX ladder will not appear for another two months. There are a couple of points to be cleared up. Firstly the question of retaining the names of licensed Amateurs, limited or otherwise, who place their calls on the ladder, secondly the removal of names of inactive or non-reporting listeners.

I have cards made out here for 22 members of the ladder. This month I have heard from 10 of them, those I have not heard from for maybe six months or more.

I would be pleased to hear any comments on this matter, and for any possible re-drafting on the contents of the scores.

The last part of the up date this month, which

being a short month forced me to close before all reports had been received. 72, Don L5005.

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Sub-Editor: CYRIL MAUDE, VK3ECK

2 Clarendon St., Avondale Heights, W.E. Vic.

News time is here again. Well there is not much to say except thank you to all those contributors who have sent in typed or legible notes this month. In this edition of "A.H." is a list of copy dates for "A.H." for the month of March. Just one thing more. Not only would the other sub-editors and the editor would very much appreciate it if all copy could be typewritten on half a foolscap page and double spaced with a one inch margin at each side. T.S. Cyril VK3ECK.

#### NEW SOUTH WALES

The VK3 New Year Field Day results were in...but are not decipherable, so I am unable to include them. Sub-editor? The V.H.F. group did a direct survey and worked with a L.C.A.O. 1-100,000 map. Among the notable contacts was one between Eddie VK1VP/W and Alex VK3AAK at Culmura, a distance of 110 miles. On the M.C. Ray VK3AWL at Merimbula. To all those who participated, the committee wish to say thank you, and if you have not been in a Field Day before, will give it a try next year. Talking of Field days, it is felt that the club should consider holding a separate one when a monetary prize is offered for a 3 mx for hunt at a well known convention.

The VK3 V.H.F. Group certainly counted their blessings when the emergency bands came to Hobart. It was most gratifying to see the Amateur services doing such fine work, helping with the emergency communications. To those VK3's who were burnt out we send our best 72 and our estimation of \$10, hoping it will help some amateur.

The 3 mx Morse session is becoming very popular as we now have four very capable operators in IARF, LAHW, 3ZQ and 3ANY. The session starts at 2000 hours most weekends. Band activity is a little slow, possibly because of the Morse sessions, but will no doubt adjust itself in a couple of months. Fox hunting is also popular, it used to be the 3 mx for fox day, is held on the fourth Wednesday in each month and the 6 mx fox hunt on the Sunday following the V.H.F. Group meeting. T.S. Stephen EZEK.

#### HUNTER BRANCH

SS Ms: During the month things have been quiet, the last DX was on Jan. 28 when some VK3s and VK4s were worked; nothing else since, only lots of tuning and calling when Channel 7 was heard.

The big highlight of the month was working Jean Duplat, YK5AB, on this band, maritime mobiles on the S.S. Caesar. He was worked many times by the local SS Mc. gang. He said he had a 1000 watt rig and a 1000 watt GPO 40W Neumes and hopes to have both 144 and 52 Mc. gear when next in these waters. He also hopes to build better gear for home station and work some VKs from Neumes.

On the 2nd of the month he was working ZEMO usually can be heard on the Saturday and Sunday net; a few others join in when they are free to do so. Quite a few are either still getting ready for, or repairing gear after field days.

We from the Hunter Branch extend our sympathy to the VK3 boys in the disastrous Hunter and district bush fires.

144 Ms: Some fair openings have been had on the 144 band, mostly from the coast and inland and most of the boys have got among the DX. New ones to break the "round barrier" to Sydney are Frank ZEZF and Ian ZZIO.

Most nights this band is rather quiet with only Sydney and the coast being heard. Most nights each week there are a few locals to be heard usually ZEZF, ZKWM, ZZMO, ZZPF and others when work permits.

Berry ZEZF is now known as the "Red Devil" of the 144 band. He has recently acquired a c.w. and is awaiting a full call. He is busy building himself a quad, allegedly to catch the r.f. on 144 Mc. but will move there likely trap the birds.

The Y.A.C. in Maitland is starting a radio club and guess who is teacher-nome other than Kevin ZKWW. The official opening was on Friday, 24th Feb. Among the official guests were Gordon ZEZF, Secretary of the Hunter Branch, and Keith ZAKK, of the

## CLOSING DATES FOR COPY TO V.H.F. SUB-EDITOR

Correspondents to the V.H.F. Page are reminded that the Sub-Editor must receive their notes by the following date:

April 29	August 26
May 27	September 26
June 24	October 26
July 28	November 26

Remember also, all copy where possible should be type written on one side of half a foolscap page (6 x 8 inches) with a one inch margin on each side, and double spaced.

Westlakes Radio Club. I notice that the v.h.f. was not among the invited guests, maybe they don't know about v.h.f. in these parts. T.S. Mac VK3EMO.

#### QUEENSLAND

Activity in VK3 over the past month has not been to the level where one has to look for a vacant spot on 8 or 10 metres, but the average v.h.f. could average four or five contacts per day.

The main activity of note this month has been the efforts by the W.I.C.E.N. group in Melbourne. Principally, this was the day as the directions fire in Hobart. The evening of that day, whilst monitoring 3 fm, 30 and 40 metres, and the 6 mx ran, some 30 m mobiles were heard operating in the Hobart area. The Melbourne mobiles and fixed stations joined in the close to avoid interference. T.S. Cyril VK3ECK.

#### QUEENSLAND

At the January v.h.f. meeting our former sub-Editor Peter GZP attended his resignation. We were sorry to see Peter leave Brisbane, but no doubt he has made many friends in Townsville by now.

At this meeting Roy 4ZRM was elected President and a hearty vote of confidence given. The outgoing President Mick 4ZAA and Royce 4ZR was elected Hon. Treasurer.

It was also decided, in view of the activity on higher v.h.f. bands in the South, that the Queensland group should hold a joint and actively participate in similar experiments. Subsequently, a group project was formulated to establish 6 mx men on 3 mx, and 2 mx men on 2 mx. These units are to be made available. Roy 4ZRM has made available his workshop facilities at his new QTH.

At the moment of writing, David 4ZDF, Ron 4ZC, Moyra 4ZB and Alan 4ZD are turning up the initial construction details of the project. The project was fully discussed at the Feb. v.h.f. meeting when Roy 4ZRM introduced several suitable circuits to the members. The members of the group are Roy 4ZRM, Jim 4ZG, Chelmsford, New Zealand, V.H.F. Group, was chosen for the 2 mx project. This is a three transistor converter using 4ZGZL, with a total chassis space of 31 inches square. It is very compact.

Laurie 4ZBM was going into the matter of antenna on behalf of the group. Speaking about antennas, Bill 4ZED very generously gave four 15 element beams to the 4ZL Mc. group. The first of first come, first served. Bill's stipulation was that the recipients must put a signal on 4ZL.

For forthcoming events, involving the International Scouts' Convention at Jindalee from mid Dec. 1967, with the 1968 State Scout Jamboree just around the corner, this brought back memories of other days. There will no doubt be an Easter Scout Convention as the International Convention is to be the big event. Mick 4ZAA said that we could well expect a large number of visitors from all over the world. Mobiles and portable rigs will be the order of the day, so what about it mates! Final plans have still to be formulated.

Our attention was also drawn to new sixths, which will be based on the North Coast. A special plea was put in for John 4ZL and Arthur 4ZG at Southport and Labrador respectively. They would like to work into Brisbane, so don't forget to point the beam in that direction.

The serious problem of 144 on 6 mx band is still a matter for further discussion. However, in the meantime all Queensland Amateurs are requested to stay off the band during television hours. Then, if you or your extractor please contact the Secretary of the V.H.F. Group. Please remember that your non operation in this matter will possibly affect us all.

Dane t.ZAX deserved a kudos towards the hexcon project and it is now hoped to finalize the practical details in the not too distant future. In his report, the President thanked all those who contributed equipment and parts to the project. It was a good example of Amatuer spirit.

Graham 4ZGZ is currently re-broadcasting the Sunday morning 30 mx news on 2 mx. After one or two initial problems were overcome, Graham has continued and after last Sunday's news quite a few 3 mx stations were on the air. Our thanks go to Graham for providing this facility.

If any Amateur is interested in our v.h.f. project, he is cordially invited to contact the V.H.F. Group Brisbane through the International Secretary, W.L.A. Box 63AJ, G.P.O. Brisbane. We will do what we can to assist T.S. Alan 4ZAK.

#### TOWNSVILLE AND DISTRICT

Southern DX has decreased rapidly during the past few weeks. An opening occurred on 28th Jan. when YK3AM maritime mobile was worked at 1340 K.A.S.T. Channel 6 stations continue to be heard on most nights of any Amatuer signals except for EK2X and ZGGA at 1100 to 1300 K.A.S.T. on 1600 Web.

Northern DX shows promise with early afternoon openings to JA on 9th Feb with another opening on 10th to 1800 K.A.S.T. after work by a JA operating at 1600 Web.

On the local scene we welcome Peter 4ZPL (ex Brisbane) to the northern gang. Graham 4ZGZ is back from his annual holidays, while Phil 4ZER is on Maternity leave. Phil was recently elected president of the local radio club. Congratulations to Lance 4ZM, who recently passed the Morse exam. and is kept busy with his A.O.C.P. class. A year ago 4ZGZ and his wife moved into their new shed almost completed and signals once again are being radiated on 3 mx. Signals on 6 mx have improved since the new beam went up in November.

Chasen 4ZGZ will 3KZ has been heard operating on 6 mx with his dipole aerial. The locals are hoping to work EK2X when he puts up his new yagi. Hope it will not be late until May as we would like to work the 80 miles on both 6 and 3 mx. T.S. Bob 4ZRG.

#### SOUTH AUSTRALIA

The most recent meeting of the VK3 V.H.F. Group took the form of the Annual General Meeting. The report by the retiring chairman, Eric 4ZEE, was met with a standing ovation, as praise and criticism was leveled in the directions where it was correctly right to do so. It was most apt to realize that the state of v.h.f. Amateur activity in VK3 has not been good for some time, particularly last year. However, the majority of the chairman's report concerned the achievements of the Group, namely the re-commissioning of the bearing transmitters and the conduct of an amateur survival clinic during 1966.

At the conclusion of the mandatory business the election of officers for the ensuing year was duly carried out, and were as follows:- Chairman, Eric 4ZEE; Vice-Chairman, George 4ZG; Secretary, Jim 4ZC; Committee, Barry 4ZM and Noel 4ZDK. As usual, the election of all officers was most unanimous, primarily due to the lack of numbers that attended the A.G.M.

With respect to band activities, apart from an occasional six or seven day DX opening, it could be said that short of administering the best rates for v.h.f. activity in VK3, there is little that can be done on the matter. Perhaps a proposal that can be put forward is to obtain from the knowledge that television activity on 4ZL Mc. is on the upswings with a newcomer to the art. Of late George 4ZG has been radiating an excellent t.v. signal of high quality, to the various members of the t.v. group.

In general the outlook is most depressing at the present moment, however next month could bring an entirely different picture. T.S. Colin 4ZJZ.

★

## AWARDS FOR TECHNICAL ARTICLES

The awards for 1966 were decided at the February meeting of the Publications Committee. The vote taken at that time resulted in awards being made to:-

Harold Hepburn, VK3AFQ  
Roger Harrison, VK3ZRY

Phil Williams, VK5NN

The awards have already been sent to these gentlemen.



# FEDERAL AND DIVISIONAL MONTHLY NEWS REPORTS

(SEND CORRESPONDENCE DIRECT TO DIVISIONAL REPORTER NAMED AT PARA. END)

## FEDERAL QSL BUREAU

The QSL Manager for Israel writes: "I am asking your help for a human operation. There is a 42-year-old woman in England who has lost her son in the Second World War. The gestapo took her son away in Warsaw in October 1943 and since then she has lost all contact with him. She heard about the Radio Amateurs, and she is asking our help to find her son. His name was Max Lieberman, born Nov. 1917 in Moscow, father Boris and mother Sofia Lieberman. We would like to ask you to do all you can to find any trace of him (will you please look in the phone book under 'Barker') and give any information to Mrs. Sofia Balckova Lieberman, 22 Pallion Rd., London, W.16, England."

The Annual U.S.S.R. DX Contest is scheduled to be held from 1600 G.M.T. on May 4, to 1600 G.M.T. May 7. All bands 3.5 to 100 m. may be used and the mode is c.w. only. U.S.S.R. stations will send RST plus the number of his region, while DX stations RST plus usual serial number. Contacts must be made between 0000 and 2300 hours local time. All contacts must be made in the same city. Contacts between stations in the same continent count 1 point. Contacts between stations in different continents count 3 points. For scoring any one period of time is the operating time per contact. Logs must be sent to Box 85, Moscow, by 1st June, 1967, and must indicate the 12-hour period of operation. A DXer's first 10 highest scores in each country. Further information may be had from this Bureau.

**Honor Brew Award.** This is a new idea in Amateur Radio. To date, over three hundred have been issued to VK stations. For W.I.M.E. Certificates, send direct to WIMEL the following—a photo of Amateur Station with all home built tx and rx and the name and I.C.C. to control the station. Applications to be sent to Al Eby, WIMEL, R.D. 8, Wappingers Falls, New York 12580, U.S.A.

Ref. para these notes, March "A.R." re proposed visiting visit to W.I.M.E. Bill Clegg, who has written, it has been necessary to make a new routing, leaving here on 7th March but not going to Australia. This will make it possible to take a more leisurely trip next year. Please advise WIMEL, VK1WFO, VK2VATN, VZ3SON, VK3KAR and VK3GARV."

Advance information on the 1967 QRP Club's QSO Party from Gta. Aug. 18, to 23, August is to hand. Further details will be published later.

**VKL Traffic** through this Bureau continues to increase heavily. Cards handled during the short month of February totalled 16,465, the highest monthly total ever recorded in the 36 years records. This represents an increase of 12 per cent. over any previous month.

—Ray Jones, VK3RJ, Manager

with O.T.C. and Mr. Knowles offered him heartfelt congratulations and best wishes for a successful future.

Frank made a suitable response, particularly mentioning the work of the Y.R.S. supervisor, Rex VK3YA.

The lecturer, Keith VK3ZAU, began by stating that the most efficient system of transmission is inhibitory to noise. It followed that a.s.b. d.s.b. w.b.f.m.s.m. and h.f.o. In that order. For the purposes of this lecture, however, attention would be given to those systems allowing direct transmission of speech.

Comparing a.m. with a.f.c. it was shown how the latter achieves its superiority by getting rid of the characteristics that swallowed up so much power—the carrier, for instance, with further efficiency being gained by transferring all the intelligence into one sideband.

A further advantage in a.f.c. transmitters was the greater ease of switching power levels for short or long distance working. This was one of the appeals of a.s.b. as the signal may be generated at very low levels, then amplified to the desired output level with linear amplifiers.

For best results on both v.h.f. and h.f. bands, a receiver should have a low noise figure and good stability for any mode. If the use of a.s.b. is considered, amateurs must realize the inadequacy of their present receivers. Keith further considered this to be progress. In addition to drift in tunable receivers, it was amazing how many v.h.f. converters had an oscillator injection which was far from a T9 noise.

A considerable part of the lecture was devoted to ways and means of bringing receivers up to the standard required for the reception of a.s.b. signals. In addition, a comparison was made in respect of the stand-by detector and detector and h.f.o. against the more common method of incorporating a product detector.

The various points in both receiver and transmitter design were explained with the aid of large circuit drawings. Keith had prepared his lecture thoroughly, in great detail, and at its conclusion the vote of thanks moved that the popular IAAH was well supported by the audience.

Apologies for non-attendance came from Peter VK3ZPC and Warwick Johnston. The latter indicated that he was willing to continue with the functions of recorder and co-editor of the Bulletin. Warwick, who has also been acting lately as minute secretary at monthly meetings, is one of a small band of stalwarts without whose help the work of the Division would come to a standstill.

Apologies for Institute membership were received from the following, and they were duly accepted by the meeting: Full member—Gordon Chipsham, VK3EI; Associates—Milton Moore, John Hamwood, Ken Smith, Regional Councilors, John Brier, Ernest Allard.

President Tom reported that during the month the Federal President (Max VK2ZB) and Federal Secretary (Peter VK3EE) paid a visit to Sydney and met members of Council and the Constitution Committee. The main purpose of the visit was to discuss the various problems that had arisen in regard to the proposed Federal Constitution.

A member of the Constitution Committee, Bill VK3YLS, gave a resume of the most controversial discussions and pointed out that if these discussions were continued it was felt that members of Federal Executive would now have a better appreciation of the reasons behind the N.S.W. Division's stand on these matters.

With reference to the situation in Tasmania, my wife and I take this opportunity of offering the deepest sympathy of all VK3 members to our Tasmanian friends in their tragic losses, both in lives and property.

The Federal President reported that four Amateurs had been among those whose homes

had been completely destroyed. One Amateur, Mr. M. K. Koglin, VK3TMK, lost his life in the bush fires.—Editor 1. Federal Executive had initiated a W.I.A. Fund and it was hoped members would contribute liberally. Donations could be addressed to the Federal Executive, W.I.A., P.O. Box 38, East Melbourne. The VK3 Divisional Council had made an initial payment of \$10 towards the fund.

Continuing with the interview, the visitor expressed disappointment at the response to the I.T.U. Fund, particularly by the larger Divisions. Later, when dealing with the future of the Australian Radio Man stressed the danger to the Australian Radio Man, particularly in Region 2, by the emergence of Asian countries who were pressing their demands for more and more frequency space. It was a matter of urgency that Amateurs should participate in the I.T.U. Fund and so that we would have representation in the fight to save our bands.

We have already referred several times in these notes to the well-equipped library at Wireless Institute, Canberra. As Arthur Cross Next, this has been installed and built up for the benefit of all members, and it is very disappointing to all concerned that greater use is not being made of it. Keith VK3ZU is doing a good job in this regard and would be pleased to help you with any queries about the library. Adrian VK3HE has donated a complete set of QST magazines covering a period of 15 years. Many thanks, Adrian!

On Sunday, May 7th, we donned our skinning suits and joined the crowd heading for the Gosford Field Day. Even torrential rain could not dampen our Gosford friends, who have a reputation for turning out on all occasions. The day was a success and a change of venue was made from the Racecourse to the Showground, where there was more cover and the programme went on as planned. In spite of almost continuous rain, the attendance appeared to be high, with many visitors from all over the place. We noticed Tex VK3LAHF, a K3 mobile marine, while Arthur VK3KEP returned home to Inverell after an interstate pilgrimage marching for steam engine competition in Gosford for the Field Day and washed the soot out of his throat with a few swigs. 13. Ivan VK3AIM

## HUNTER BRANCH

The Annual General Meeting of the Branch, which was held on March 3, proved to be the usual democratic affair with all positions being filled satisfactorily. Following the signing of several outside election posters and the calling to order of the meeting several times during the two and a half minutes of the action, everything went very smoothly. Visiting Divisional President O'Donnell took the chair during the proceedings and, with the assistance of the meeting, created one new post of great importance to the Branch. The returning Officer (Frank MAPC) was elected as the whole saddle steamer Radio in any way possible but he had pointed out that the nature of his employment is such that he has not enough time to devote full time to some energies. Frank and I, in view of this, came to an understanding that I suspect that this could have been Gordon Z2SG, suggested that Frank be approached regarding his willingness to become Branch Patron. This he agreed and was duly elected at the meeting. This new office is one of considerable prestige and it is fortunate indeed that the Branch has such a capable man as Frank to fill the position. With his long record of public service and his deep interest in community affairs, Frank is the ideal man for the job and we all wish him well.

Another Frank, this time Z2X, was elected to take over the Branch Presidency. Although a relative newcomer to the amateur DX field, Frank has been interested in the welfare of his fellow Amateurs. A keen v.h.f. man, Frank is a worthy successor to the long line of Branch Presidents who have served our Branch in the past. The company present apparently found the past committee to their liking, because the remainder of the executive were re-elected to a man. Briefly, these are as follows: Vice-Presidents, Bill ZXT and Keith ZAKK, Hon.

## SILENT KEY

It is with deep regret that we record the passing of:

VKSADQ (ex VK3LI)—  
C. L. ("Lyle") Rogers.  
VK5OK—Lloyd Brice.  
VK7MK—M. K. Koglin.



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# SOUTH AUSTRALIA

The monthly meeting of the VK5 Division was held on the last day of February, and took the form of the monthly general meeting and the annual general meeting combined. The members of course that lot of newsworthy did not turn up although despite this there were only a few chairs at the head table, were come along for our annual battle with the W.I.A. It was the same old tale, we were again disappointed to see "Grumpy" Taylor (STY) take his chairman's seat and open the meeting, only to apologise for the non-appearance of the President (Ross SKF), explaining he would be along later in the evening. After he had spoken a few words the "President" Anyway, Ross eventually appeared, "Grumpy" vacated the chair, and the annual general meeting was under way.

Nothing very important disturbed the alumnus meeting, there was no ballot for Council members, and the list of contestants being nominated, in fact the only new member was Trevor SZIS, who replaced the retiring Past President in Phil SNN, and the amount of money raised was up markedly, particularly in the blood money. Everybody woke up with a start when the master of honours came up, mainly because Harry SMY speaking for himself and the secretary. Al SMY had been asked to do this, but the section voted at last year's meeting to reduce it. It took some time for everybody to recover from the shock, but when they did, they threw the suggestion of the president, and had no second of their own, restimated they would have increased it without hesitation.

After this burst of unexpected activity had subsided, the meeting sunk back into the arms of Mort-Mortes-Morpheus—well, they went back to sleep. There was one up for discussion—and the distribution of SWL cards which was the only way they knew the annual general meeting had finished. The next item on the programme was the monthly general meeting which did not last long, and if I may say so, for the valiant efforts of one or two die-hards in the audience, it would have died on its feet in a matter of minutes. Nothing of any importance came up, and the evenings were over at 9 p.m. with everybody having had their share of talk, and one or two more than their share. The only disappointed person was Ross SKF, who had been hoping to repeat his feat of last year in closing both meetings by 10 p.m. No hope there, you know what we last year, but we were on our metal this time! Read metal of course.

Among the visitors at the meeting was Dick SWILK from Melbourne, accompanied by his son Tony, who is a regular at VK5, and a possible future VK5 call sign as well.

One matter that did come up at the monthly general meeting was the matter of the proposed Science Centre for VK5, of which we were quite interested, although from the information supplied it was cast out by the Councillor, Al SEK, and some verbal information from Phil SNN, our chances of ever participating in such a venture are somewhat remote, mainly because of finance, or the lack of it.

One of my espionage agents, located right in the middle of VK5, reported that Jim, that was Wyck SWM, of ABC Radio, has left his QTH of Henley South and is now residing among the upper strata of Fitzroy. I say old boy, have to be on your best behaviour now, not running around with the girls on to the carpet, and definitely no more than five pess on the knife at once! Long time no see, Bruder.

Have not heard anything of that old-timer Roy SAC for a while. Last I heard from him he was not home OM, but the XYL gave me all the information. On the other hand, he will always accept my congratulations. Possibly see you and the XYL one day when you have more time to spend in the "big smoke".

I must be rising a little late these Sunday evenings as never before. SDO on the well known sheet with that interesting gem in VK5. Not that I listen to VK5s of course, that is not since they appointed their President without consulting me! Oh that such wickedness should exist.

Several of the VK5 gang are looking sideways at me since I just a part-time in the local W.I.A. notes in the morning newspaper concerning the student classes being held at the Goodwood Technical Boys' School at night time. The reason? Well, over the following week-end the class rooms were broken into

and several pieces of equipment disappeared into smoke. I know my publicity is considered to be good, but not that good, please!

Had a quick look around 7 Mc. the other evening and sure enough the first station I came upon was Frank (SAC) who had up yes, you guessed it—Carl SSS, and Frank was doing an expert job of convincing Carl that he should buy a 12-inch stereo 1p. called "Thanks for the Memory". I sounded quite reasonable and said: "I would buy it for one myself, but I will keep the pamphlet for you." I did not hear Carl's reply as my 14th call to the evening meal was heard, and as it sounded somewhat exasperated, I decided to make dissolution the main part of my speech.

Bill SZD was heard in QSLs with a VK5 who offered to give him a burst of double sideband just to demonstrate, but Bill, who is evidently a man after my own heart, tactfully declined the offer on the plea that his ART did not like to transmit on any frequency. In my defense I have sent him a membership card for my well known Shun Sideband Association. He looks like a promising member!

Had an exciting ride with SNG the other evening. He called CQ SNG in Hindmarsh Square, Hindmarsh Street, Monarto Street, the end of the Adelaide Oval, and finally landed on my SHH at the Light Station on top of the hill. No, I was not in the car—but I copied him all the way.

Talking of Morse code and student classes, brings to mind the previous incident in Hove, and the brilliant idea "I" had, which is by now a happily married couple, as so my information tells me, but giving no date or further information. Anyway, in my unique position of being the happiest married man in VK5, I can't help but say that it is always my duty to give the newly married Amateur that well known advice, "DX before Dishes". "What's that dear. Yes, I am coming, now, sorry about that cup and saucer, it must fly up in the air. I think it will be bent a little!"

Did you read the par. in the local paper concerning the outbreak of Xmas walkie-talkie presents and just how the situation became worse in Canada with the St. Sebastian causing more than 3,000 false alarms until their batteries ran down or the novelty wore off? So bad was the position for a while that the police department sought the services of the Radio Amateurs to help stamp out the nuisance by getting radio hearings on the walkie-talkies. It must be my warped sense of humour, but probably the results of my mis-spent childhood, but I could not be any more sorry for the poor unsuspecting youngster at a Boy Scout banquet where the waitresses were dressed by an overseer on the tables with a walkie-talkie. The young Scout, with his walkie-talkie on the service, was given a dozen extra dessert sent to his table before he was discovered, to say nothing of a few other delicacies. You can't beat em!

February is always a bad month for Divisional sub-editors. Firstly, the magazine is likely to be delivered uncorrected and beyond control, which means that the telephone run hot from irate readers wanting to know where the magazine has disappeared to, and then when it finally appears, especially if the divisional notes are not in the correct circuit (or vice versa) then the telephones start again and the poor sub-editor is accused of anything from sabotage to making a special trip across the VK5 and tearing up all the little rubber letters that Radio Amateurs send in to print the magazine. This year was no exception because the "Mag" was later than usual, plus no Divisional notes appeared, and the aforementioned irate readers gathered their courage and wrote to the editor. The reason in my defence was that I had sent the notes across as usual, and if anybody thought that I would go to the trouble of writing all those paragraphs in the knowledge that they would not be printed, then I would rather stay home, they thought. Anyway, it does not do much good at least the magazine is not as useless as the odd one would have us believe.

Called into the QTH of Joe SJO the other morning to see how he was making out after his recent return from America. He was sitting up in the sitting room looking at the goggle box, with his XYL Nellie fussing around him as if he was the Rajah of Rangoongabong or something. Personally, I don't care what he did with it, I just want to know if it is all just a racket to get the V.I.P. treatment. Nice to see you Joe.

Many read with interest the write-up in the VK5 Journal on W.I.C.E.N. and its formation in this State. They also read with pleasure the news as how Jim SJX had stayed long and hard to convince Council that such a set-up would be to the good of Amateur Radio in general. Jim always had the idea of W.I.C.E.N. running around in his head, and for many months was bopping up and down

at general meetings trying to drive the point at Council, so much so, that it was decided to put the whole matter back in his lap, secure in the knowledge that even he could not surmount all the opposition from the part of forming such an organization. Of course, where the mistake was made was in not allowing for the persistence and obstinacy displayed when a wild Irishman really gets his back up. Jim was ready to start his Petition Department, the E.S.C., the P.M.G.'s Department, and anybody who did not support him first and duck for cover. It was not long before he had a working policy which he handed out to Council, and I must apologize to it, when it was a going concern, backed out in favour of John SJC, who kept it rolling until it was taken over by the "grumpy one", Geoff STY. The moral is of course "Don't mess with a wild Irishman for fear of being mauled by yourself."

Arthur PHY is another of the stalwarts to be laid up, although reports to hand indicate that he is making satisfactory progress back to normal health. Understand the main thing though is he misses it in his a.b.s. and his contacts. Fancy missing the big day every year!

Jack SLL and XYL are off for one of their tri-yearly jaunts again. This time to Victor Harbour. Usually about this time of the year they move off for the South East, but I suppose a change is as good as a holiday, or should I say as good as an excuse for a holiday as any?

Max SGF should be quite proud of his harmonic. Jeff SZGF, these days, in view of the fact that Jeff has recently passed his broadcast ticket and is at the moment taking a shift at the B.R.C. Radio Broadcasting station in the States. What's that? You don't know the station—you must be kidding—S.G.F. of course!

I cannot help but notice that despite the fact that Jack SLL and XYL are off for their tri-yearly notes in the magazine a certain VK5 gentleman from way up in the hills, Phil SNN to wit, always manages to get his notes on "The Things" well to the fore. Apparently the reason is that he makes bacon, bacon and chickens, packets of 50 cigarettes, bacon etc., and etc., again, over to the editorial staff might bear investigating, although I often send them my best wishes, what more do they want?

If looks at something is going to be done for prospective students, then I would like to refer to the Model Schools in VK5. Council has had several suggestions on the matter and have given it serious thought, but of course the real bug is lack of a code instructor. Surely there is someone who will be willing to give it a go, or for the students—will-be-beings.

The new Council member Trevor SZIS, will be at the Convention in VK7 as an observer, at his own expense, so it would appear that he has his share of keen interest in the doings of the W.I.A. Let me not remind a Councillor that he carries the weight of all by holding the ball with me and informing me in no uncertain terms that his name was spelt Trevor, and not Trevor, and judging by his sis and physique, that will be okay by me!

Another stranger to me at the meeting was David SWI, who I have not seen since he met him since his return from W.I.A. and also gave me an opportunity to ask him if the stinks that followed him from America completed the job. The answer was that it was a boy, named David John, so when you are a boy, you always get my information, even if a bit late.

Was quite surprised to note that there is no associate members representative on the Council, and I would like to know what you all think about all sit getting together and nominating someone. You cannot expect to get anything without a representative to speak up for you.

Norm SNN will be relaying SWI on 20 m.w. probably by the time you are reading this. SWI will serve our members in the Northern Territories, and will probably have quite a number, and will help to keep them informed of the doings of the VK5 Division. Quite some time since we had a relay on 20 m.w. for SWI.

Council meetings will be held once again in the "Advertiser" building this year with a consequent saving of shucks for the Division. There should be more of it, say I, and without doubt the treasurer.

Am sorry, as are many others, to see Phil SNN leave the Council after all these years. He has been a valuable member, and has been put into the Division as Councillor, President and Past President, over the years, has been of untold value, and will be badly missed. We all salute you OM, in fact some of us don't dare hold your peculiar beliefs on a certain subject against you. Well, not all the time, anyway!!

Talking of Councillors, we were all shocked at the news of the passing of Lloyd BON, especially as it was to be sudden. He and I



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## \* VARIALCS

115v. 18 a. New in cartons, \$18.00 ea. or \$32.00 pair.

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100-150 Mc. Complete with tubes, \$28.

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Approximate frequency, 200 Mc. Contains 46 miniature tubes, \$30.

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EF50, 20c ea.; 7C7, 10c ea.; CV131, 8CQ6, 50c ea.; 6AC7, 20c ea.; 6AL5, 20c ea.; 6C4, 6AM5, 50c ea.; 6J6, 50c ea.; 6FQ5, 50c ea.; 12AD6, 60c ea.; 12AU6 60c ea.; 12BA6, 50c ea. Mullard MW6-2 t.v. projection tube, 3", \$1.50.

## \* SIGNAL GENERATORS

TE22 Audio Generator, freq. range: sine 20 c.p.s. to 200 kc., square 20 c.p.s. to 25 kc., in four ranges. Output: 7v. p-peak. Output impedance, 1,000 ohms. Price \$42.

## \* METERS, P25 TYPE

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## \* MINIATURE CAPACITORS

New shipment. 600 v.w. Values: 0.001, 0.02, 0.005, 0.0005, 0.0002, 0.0001 uF. \$2 for 80, plus freight.

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160 Metres - 10 Metres. Provision for phones. Complete with antenna and carrying case, \$12.00.

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Contains five OA202 silicon diodes. Pot core, capacitors, etc. 75c each.

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100,000 ohms per volt. Ranges, d.c. volts: 0.5, 2.5, 10, 50, 250, 500, 1K; a.c. volts: 2.5, 10, 50, 250, 1K; d.c. current: 10 uA, 1 mA, 25 mA, 250 mA., 10 amp.; resistance: 20K, 200K ohms, 2 megohms, 20 megohms. To clear, \$2.95.

## \* POTENTIOMETERS

Wire wound, 40c each; carbon, 25c each.

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1/2 watt, I.R.C., Welwyn, Eire, Ducon, Philips, \$2 per 100.

## \* 1/2 H.P. 2-STROKE MOTORS

Ohsisson and Rice. Brand new, just imported from America. Weighs only 5 1/2 lbs. 6,300 r.p.m., supplied with 3:1 reduction gearbox, output 2,100 r.p.m. Ideal for driving Alternators for Field Days. Fuel consumption 1 pint per hour. \$30.

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Beginners are welcome, ask Jim and Laurie Gardiner any questions. They are Amateur Radio operators and will be only too pleased to assist.

## \* CRYSTALS

Personal shoppers only, \$1 each.

## \* SPECIALS

New 815 valve, \$1. New DA41 (TZ40), \$1.50. 3000 type Relays, 50c each. Inter-Office Phones, 15-station type, \$4 each. 7-pin skirted Valve Sockets, P.T.F.E. insulation, silver plated, only 20c each, c/w shield. Speaker Transformers: 7000 ohms to 2 ohms; 10,000 ohms to 3.5 ohms; 50c each. 9-pin skirted P.T.F.E. Valve Sockets with shield, 50c each. 3 uF. 1000v. d.c. Block Capacitors. Only 25c each or \$2 per dozen.

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